Hospital Library

This Issue Exceeds 87,300 Copies

THE JOURNAL

OF THE

American Medical Association

Subscription, $7.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 104, No. 20 | 535 North Dearborn Street, CHICAGO, ILL. | MAY 18, 1935

CONTENTS AND SUBJECT INDEX

Fever Therapy: Results for Gonorrheal Arthritis, Chronic Infectious (Atrophic) Arthritis, and Other Forms of "Rheumatism." Philip S. Hench, M.D.; Charles H. Slocumb, M.D., and Walter C. Popp, M.D., Rochester, Minn..1779

Black Spider Bite. J. M. Frawley, M.D., and H. M. Ginsburg, M.D., Fresno, Calif.....1790

The Effect of Oil of Peppermint on the Emptying Time of the Stomach. H. I. Sapoznik, M.D.; R. A. Arens, M.D.; Jacob Meyer, M.D., and Heinrich Necheles, M.D., Chicago.....1792

Artificial Fever Therapy in Treatment of Corneal Ulcer and Acute Iritis. E. L. Whitney, M.D., Detroit 1794

Treatment of Gonorrhea in the Female by Means of Systemic and Additional Pelvic Heating. William Bierman, M.D., and E. A. Horowitz, M.D., New York...1797

Trichinosis. Wesley W. Spink, M.D., and Donald L. Augustine, Sc.D., Boston.....1801

Cardiac Pain in Children. Harold C. Lueth, M.D., Evanston, Ill., and Don C. Sutton, M.D., Chicago.1806

Sterility and the X-Rays. Max Huhner, M.D., New York....1808

Enterogenous Cysts of the Duodenum. Clarence E. Gardner Jr., M.D., and Deryl Hart, M.D., Durham, N. C.....1809

Apiol Polyneuritis. Robert Denison, M.D., Harrisburg, Pa., and J. C. Yaskin, M.D., Philadelphia...1812

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Apparatus for Application of Suction and Pressure to Lower Extremities in Peripheral Vascular Disease. J. J. Short, M.D., New York..1814

A Laboratory Test of "Hoxin" as a Claimed Cancer "Cure." C. C. Little, Sc.D., and A. M. Cloudman, Ph.D., Bar Harbor, Maine....1815

GLANDULAR PHYSIOLOGY AND THERAPY

The Therapeutic Use of Estrogenic Substances. Emil Novak, M.D., Baltimore 1815

THERAPEUTICS

Therapy of the Cook County Hospital: Iritis (Iridocyclitis) and Choroiditis. Edited by Bernard Fantus, M.D., Chicago. Outline by Dr. Sanford R. Gifford.....1821

COUNCIL ON PHYSICAL THERAPY 1823

COUNCIL ON PHARMACY AND CHEMISTRY 1824

EDITORIALS

Efficacy of Typhoid Vaccination.1826

Retarded Growth and Longevity.1826

Cullen's Sign in Ruptured Ectopic Pregnancy 1828

CURRENT COMMENT

Blood Transfusion Conference..1828

(Subject Index on next page)

ASSOCIATION NEWS 1829

A. M. A. CONVENTION, ATLANTIC CITY, N. J., JUNE 10-14, 1935

ready today—MAYO CLINIC VOLUME

The 1935 Mayo Clinic Volume is just off press! It is a mighty fine volume—one of the finest that has come out of the Mayo Clinic and the Mayo Foundation in many years.

We have every reason to believe that the New (1935) Volume will top the success of last year's volume and sell out of print even more quickly—notwithstanding the fact that the number of copies printed this year is considerably larger than the number printed last year. We base our prediction on the pre-publication orders which are already on file and which continue to come in to us in great numbers every day.

The reasons are obvious: The New (1935) Mayo Clinic Volume has a particular appeal to the family physician, with contributions on such diseases and conditions as chronic ulcerative colitis, appendicitis, infections of urinary tract, ketogenic diet for bacilluria, Elliott treatment of pelvic inflammation, the "cold test" in pregnancy, iodine in exophthalmic goiter, diabetes, anemia, sinusitis, fractures, and dozens and dozens of others of equal importance.

And the surgeon and specialist will find a great wealth of new technic, new diagnostic helps, new drugs, radiology, the newer local and general anesthetics.

We urge you to place your order immediately! Delay meant disappointment for many last year!

Further details—SAUNDERS ADVERTISEMENT—page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics.

Abortion, therapeutic, in phlebitis.....1848
Acid, boric, in reducing remedies.1837; ab-1865
hydrochloric acid, and pallor of nasal mucosa 1845
Acne vulgaris, roentgen treatment.....1848
Addison's Disease, tuberculosis as cause.ab-1857
Alum-alcohol prescription (correction).....1848
Amenorrhea, estrogenic substances for....*1817
American Association for Study and Control of Rheumatic Diseases.....1833
Amniotin *1816
Anemia, "neuro-anemias" 1838
pernicious, liver feeding.....ab-1868
Anesthesia, hepatic function relation to..ab-1863
statistical study ab-1864
Antihormones, concept of.....*1820
Apiol (Savatan) polyneuritis.....*1812
Appendicitis, acute, in tapeworm.....ab-1867
Arthritis, chronic atrophic, antivirus for.ab-1859
fever therapy *1779
fundus oculi changes in polyarthritis..ab-1867
gonorrheal, fever therapy.....*1783; *1788
short wave therapy.....ab-1867
Asphyxia, methods of resuscitation.....1835
Association News 1829
Asthma, autohemotherapy ab-1862
Bacteriophage in water supplies.....1836
Biliary Tract, drainage, bile secretion in.ab-1863
Blood circulation, passage of bacteria from lungs to ab-1859
coagulation and platelets.....ab-1863
pressure hormones as cause of protein shock ab-1865
transfusion conference, Soviet Russia..E-1828
vessels, disease, apparatus for applying suction and pressure in.....*1814
Board Examinations.....1849
Book Notices.....1849
Books Received.....Adv. page 32
Breast cancer, 10 years of surgery.....ab-1860
hypertrophy of mammary gland.....1847
painful, estrogenic substance for.....*1820
Bureau of Investigation.....1843
Cancer, early diagnosis, Buenos Aires.....1837
etiologic action of sunlight.....1837
Institute, central, Berlin.....1837
nostrum, laboratory test of "Hoxin"....*1815
Carbon Tetrachloride, industrial hazards...1846
Cherechevsky, Nicolas A., lectures.....1839
Choroiditis, therapy *1821
Cigaret lighter, no toxic hazard from.....1848
Cod Liver Oil, effect on organs.....ab-1868
Congress, medical, in 1935, Russia.....1839
of Neurology and Psychiatry, joint session at Amsterdam 1838
U. S., medical bills in.....1833
Cooper, C. W., impostor imprisoned.....1833
Cornea, ulcer, fever therapy.....*1794
Correspondence 1844
Council on Pharmacy and Chemistry.....1824
Council on Physical Therapy.....1823
Cowpox virus, preservation of purified suspensions ab-1859
Crawford, Jane Todd, memorial to.....1830
Cullen's Sign.....E-1828
Curie, Madame, British memorial to.....1834
Dana Medal, Dr. W. H. Wilder awarded..1830
Deaths 1840
Dental Practice, admission to, Germany...1837
Diabetes and duodenal diverticula.....ab-1853
early or potential, and pregnancy.....1847
Diathesis, hemorrhagic, and tuberculosis.ab-1865
Diphtheria carriers, lemon juice for....ab-1867
immunity, effect of scarlet fever on...ab-1854
toxic, sugar tolerance curves in.....ab-1862
Duodenum cysts, enterogenous.....*1809
diverticulum and diabetes.....ab-1853
Dysmenorrhea, estrogenic principles for...*1820
Elliott treatment.....*1797; 1823
Embolism, postoperative ab-1864
Ergosterol, effect on animal structures...ab-1868
Estrus hormones, therapeutic use.....*1815
Extremities, apparatus for applying suction and pressure *1814
Eye, fundus changes in polyarthritis....ab-1867
Fasting 50 days, effect.....ab-1868
Femur, fractures of neck.....ab-1856
Fever, therapeutic, in corneal ulcer and acute iritis *1794
therapeutic, methods of producing.....*1779
Food poisoning from cream puffs, New York 1831
Foreign Letters 1834
Gangrene, spontaneous, sympathectomy in ab-1866
Gastro-intestinal Tract, effect of 50 days fast ab-1868
lymphatic leukemia with infiltrates in.ab-1868
Gonococcus Bouillon Filtrate.....1825
Gonorrhea, serodiagnosis ab-1867
treatment, pelvic heating.....*1797
vaginitis in children, estrogenic preparations for *1819
Growth, retarded, and longevity.....E-1826
Health, ninth Pan-American Conference...1838
in 1934, Wisconsin.....1832
public, increased appropriation for, Russia.1839
public, report on, Russia.....1839
Heart muscle infarction, electrocardiogram ab-1858
muscle infarction, erythrocyte sedimentation in ab-1863
pain, evaluating in children.....*1806
Hektoen Lecture, Dr. Leary gives.....1830
Hemophilia, estrogenic, luteal and gonadotropic hormones in.....ab-1857
treatment with estrogenic substance....*1820
Hoffman, F. L., retires.....1832
Hospitals, for profit: liability for delirious patient Ml-1851
voluntary, pay patients in, England.....1834
Hoxin cancer "cure" *1815
Influenza outbreak, Alaska.....1832
Insurance, health, effect of unemployment, England 1834
health, non-Aryans in panel practice, Germany 1837
International Congress of History of Medicine 1833
Neurological Congress.....1833
Intestines, complications from radium and roentgen irradiation ab-1854
anastomosis between duodenum and, in enterogenous duodenal cysts.....*1809
Intussusception, roentgen diagnosis and treatment 1836
Iritis, acute, fever therapy.....*1794
therapy *1821
Jaundice, spirochetal, mode of infection...1838
Kettering hypertherm *1785; *1786
Kidney disease, rôle of hypophysis.....ab-1866
resection of large fractions.....ab-1858
Lactation, glycosuria and lactosuria....ab-1853
Leukemia, lymphatic, with gastro-intestinal infiltrates ab-1868
Leukocytes count with positive tuberculin reactions ab-1853
Liver, function in relation to anesthesia.ab-1863
Long, Crawford, commemoration.....1829
Longevity and retarded growth.....E-1826
Lungs, bacteria pass from, to blood stream ab-1859
root, surgery.....ab-1862
Lymph Nodes, diseases.....ab-1858
Lymphoganglin cause of protein shock..ab-1865
Lymphogranuloma ab-1858
Malaria, campaign, with acrichin.....1839
parasite count and quinine concentration in blood ab-1861
Marriages 1839
Medical Examinations and Licensure.....1849
Medicolegal 1851
Meetings, Coming Meetings.....1852
Menopause, estrogenic substances for vasomotor symptoms *1819
Metabolism, basal, calculation using Read's formula ab-1865
Midwives, Bellevue School closed.....1831
Miller, William Snow, lecture.....1832
Myasthenia gravis, physostigmine for...ab-1861
Neuritis, apiol (Savatan) polyneuritis....*1812
News 1829
Nose, pallor of mucosa and use of hydrochloric acid 1845
Obesity remedies, boric acid in...1837; ab-1865
Pancreas, diagnostic value of urine diastase ab-1856
Papaya juice, "vegetable trypsin,".....ab-1867
Parkinsonian trembling, clinical characters.1838
Pellagra, dilute hydrochloric acid for....C-1845
virus infection as cause.....ab-1860
Pelvis, heating in gonorrhea.....*1797
pneumococcic infection in adults.....ab-1854
Peppermint, oil of, effect on gastric emptying time *1792
Physicians, oversupply, England.....1834
Pituitary Body, effect of pregnancy urine on ovary-stimulating potency ab-1855
rôle in renal disease.....ab-1866
Pletniev, David D., lectures.....1839
Pregnancy and potential diabetes.....1847
bilateral phlebitis in.....1848
glycosuria and lactosuria.....ab-1853
ruptured ectopic, Cullen's sign in.....E-1828
toxemia, cold test in prognosis of.....ab-1855
urine, effect on ovary-stimulating potency of hypophyses.....ab-1855
Progynon *1816
Pruritus ani ab-1853
Psoriasis as allergic manifestation.....ab-1859
Purpura hemorrhagica, snake venom for.ab-1854
tuberculosis and ab-1865
Quarantine Station reopened.....1829
Queries and Minor Notes.....1845
Quinine intoxication and idiosyncrasy...ab-1865
Quinoa seeds as food.....1837
Radio Program.....1829
Rectum gonorrhea, diagnosis by cultural methods C-1844
stricture, Jelks' operation for.....ab-1856
Respiration function in pulmonary tuberculosis ab-1867
Rheumatism, acute articular, cerebral disorders in ab-1863
fever therapy *1779
Rickets, blood phosphorus in.....ab-1853
Roentgen Rays and sterility.....*1808
St. Louis Clinics.....1831
Savatan, polyneuritis from.....*1812
Scarlet Fever, effect on diphtheria immunity ab-1854
Sinusitis, chronic, treatment.....1848
Skin tests in trichinosis.....*1801
tests (intracutaneous), regional differences ab-1866
Snake venom to control bleeding.....ab-1854
Society Proceedings.....1852
Spider bites, diagnosis; treatment.....*1790
Spinal Cord, alcoholization for radiculitis..1848
State Board Examinations.....1849
Sterility and x-rays.....*1808
Sterilization, sexual, of mental defectives, objections 1834
Stomach, emptying time, effect of oil of peppermint *1792
secretion of mucus and acid by.....ab-1857
surgical diseases, intramural nerve plexuses in ab-1866
Sunlight, cancerigenic action.....1837
Sympathectomy, renal ab-1861
Syphilis, hereditary, treatment.....1847
treatment 1846
Tabes Dorsalis, alcoholization for pains....1848
treatment 1845
Tapeworm, acute appendicitis in.....ab-1867
Testicles, sterility and the x-rays.....*1808
Theelin; Theelol.....*1816
Therapeutics of Cook County Hospital....*1821
Thromboplastic substances 1824
Thrombosis, postoperative ab-1864
Tomatoes, sensitivity to.....1847
Tonics and Sedatives.....Adv. page 28
Trichinosis, diagnosis, skin and precipitin tests *1801
Tuberculin reactions (positive), leukocytes in ab-1853
Tuberculosis and hemorrhagic diathesis..ab-1865
cause of Addison's disease.....ab-1857
Forlanini Institute scholarship.....1833
immunization, B C G, lesions after...ab-1857
Meinicke's seroreaction ab-1864
primary focus in adults.....1835
pulmonary, bactericidal power of blood serum ab-1862
pulmonary, phytotoxic index in.....ab-1864
pulmonary, respiratory function in....ab-1867
pulmonary, respiratory tests in.....ab-1864
survey in Indiana.....1832
virus, filtrability ab-1857
Tulsa Clinical Conference.....1832
Tumors, granulosa cell.....ab-1868
institute, new, New York City.....1831
Typhoid vaccination, efficacy.....E-1826
Urine diastase, diagnostic value.....ab-1856
Uterus cancer, intestinal complications from radium and x-rays.....ab-1854
hemorrhage (functional), estrogenic substances for *1819
Viosterol, effect on animal structures....ab-1868
Vital Statistics, mortality, Germany.....1836
mortality rate increased, Kentucky.....1830
Vitamin C in conifer needles, red currants and cabbage 1839
Vomiting and hypochloremia.....ab-1863
Water supplies, bacteriophage in.....1836
Wills: testamentary capacity; criteria of.Ml-1852
Yellow Fever in South America.....1838

THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $7.00 a year. 25c a copy. Canadian $8.50. Foreign $11.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

Volume 104. No. 20. *Copyright 1935 by the American Medical Association.*

BOOK BUYING SIMPLIFIED

We supply new and standard medical works of all publishers
ONE ORDER—ONE REMITTANCE
GET OUR LATEST BULLETIN
CHICAGO MEDICAL BOOK CO. 436 S. Honore St. CHICAGO

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 104, NO. 20 CHICAGO, ILLINOIS MAY 18, 1935

FEVER THERAPY

RESULTS FOR GONORRHEAL ARTHRITIS, CHRONIC INFECTIOUS (ATROPHIC) ARTHRITIS, AND OTHER FORMS OF "RHEUMATISM"

PHILIP S. HENCH, M.D.
CHARLES H. SLOCUMB, M.D.
AND
WALTER C. POPP, M.D.
ROCHESTER, MINN.

Those diseases which medicines do not cure, iron (the knife) cures; those which iron cannot cure, fire cures; and those which fire cannot cure are to be reckoned wholly incurable.

This last of the hippocratic aphorisms might be taken as the source of the mandate accepted by some of the advocates of therapeutic hyperpyrexia, for it is their somewhat optimistic opinion that certain diseases which medicines or surgery cannot cure may be cured in the fires of fever therapy, and that those which are not cured thereby are at the moment incurable. Since the days of Hippocrates, fever has been a major concern of physicians, most of whom have looked on it as a defensive mechanism against disease. An altered regard for fever was initiated by Claude Bernard, Virchow and others, who demonstrated supposedly harmful physiologic and pathologic reactions thereto.[1] Thus began the era of antipyresis by medical and physical means.

That fever, however, must serve some very useful purpose, or nature would not have retained it so tenaciously as a reaction process to invasion of harmful substances, was the conclusion of Welch[2] and others who, in the past forty years, have fostered a return of the former idea of fever's beneficence. The current development of fever therapy is a testimonial to the wide acceptance of their views. Under certain conditions, and within certain limits, hyperthermia is a state not to be prevented but to be fostered. Various methods for its more or less safe production are being increasingly elaborated. The day of pyretotherapy, of "friendly fever," is already well advanced.

METHODS OF PRODUCING THERAPEUTIC FEVER

Many old and new methods are being advocated for fever therapy. Since the sixteenth century, curative effects in syphilis and various forms of rheumatism have been ascribed by the Japanese to frequent bathing in very hot volcanic water. The temperature of the water being from 113 to 128 F., it has been estimated that fevers of from 103 to 105 F. were produced thereby.[3] It has become the fashion to regard the febrile reactions of foreign protein therapy as the modern forerunner of fever therapy. Some ascribed the benefits of such reactions to other factors than the fever produced and tried to avoid the latter. As a result of Wagner-Jauregg's success with malarial therapy in syphilis, however, the febrile component of analogous reactions has regained prestige; and the use of dead organisms (Bacillus coli or typhosus) having become supplanted by the use of live (malarial) organisms, other febrile reactions, which were presumably more benign, were suggested: those of rat bite fever and relapsing fever. While certain definite results have been obtained, these various methods have the disadvantage that their reactions, once initiated, are not always entirely controllable. Hence the modern view favors a return to physical, in place of bacterial, methods of producing fever.

Steps in the development of pyretotherapy by physical means, as traced by several,[4] include the use of hot baths by Philips[5] (1883), by Schamberg and Tseng[6] (1927) and by Mehrtens and Pouppirt[7] (1929); of hot air by Rosanoff[8] (1927) and Walinski[9] (1928); of high frequency diathermy currents by Neymann and Osborne[10] (1929) and by King and Cocke[11] (1930); of radiothermy by Whitney[12] (1928), Hosmer[13] (1928), Carpenter and Page[14] (1930) and Hinsie and Blalock[15] (1931); of humidified, electrically heated cabinets by Kahler and Knollmayer[16] (1929), Berris[17] (1933) and Simpson, Kislig and Sittler[18] (1933).

From the Division of Medicine (Drs. Hench and Slocumb) and the Section on Fever Therapy (Dr. Popp), the Mayo Clinic.

1. Reimann, H. A.: Significance of Fever and Blood Protein Changes in Regard to Defense Against Infection, Ann. Int. Med. **6**: 362-374 (Sept.) 1932. Simpson, W. M.: Artificial Fever Therapy, Proc. Staff Meet. Mayo Clin. **9**: 567-571 (Sept. 19) 1934.

2. Welch, W. H.: The Cartwright Lecture on the General Pathology of Fever, M. News **52**: 365-371, 393-405, 539-544, 565-568, 1888.

3. Neymann, C. A., and Osborne, S. L.: The Development of Hyperpyrexia, Arch. Phys. Therapy **15**: 149-155 (March) 1934.

4. Simpson.[1] Neymann and Osborne.[3]

5. Philips, W. H.: Hydrotherapy, Columbus M. J. **2**: 389-402, 1883-1884.

6. Schamberg, J. F., and Tseng, H. W.: Experiments on the Therapeutic Value of Hot Baths, with Special Reference to the Treatment of Syphilis; Physiologic Observations, Am. J. Syph. **11**: 337-397 (July) 1927.

7. Mehrtens, H. G., and Pouppirt, P. S.: Hyperpyrexia Produced by Baths: Its Effect on Certain Diseases of the Nervous System, Arch. Neurol. & Psychiat. **22**: 700-708 (Oct.) 1929.

8. Rosanoff, A. J.: A Simple Thermotherapeutic Technic, with Special Reference to Fever Treatment of Neurosyphilis, Am. J. Psychiat. **7**: 489-492 (Nov.) 1927.

9. Walinski, F.: Ueber künstliche Hyperthermie auf physikalischem Wege und deren therapeutische Verwendung, Med. Klin. **24**: 488 (March 30) 1928.

10. Neymann, C. A., and Osborne, S. L.: Artificial Fever Produced by High Frequency Currents: Preliminary Report, Illinois M. J. **56**: 199-203 (Sept.) 1929.

11. King, J. C., and Cocke, E. W.: Therapeutic Fever Produced by Diathermy, with Special Reference to Its Application in the Treatment of Paresis, South. M. J. **23**: 222-228 (March) 1930.

12. Whitney, W. R.: Radiothermy, General Electric Rev. **35**: 410-412 (Aug.) 1932.

13. Hosmer, Helen R.: Heating Effects in a High Frequency Static Field, Science **68**: 325-327 (Oct. 5) 1928.

14. Carpenter, C. M., and Page, A. B.: The Production of Fever in Man by Short Radio Waves, Science **71**: 450-452 (May 2) 1930.

15. Hinsie, L. E., and Blalock, J. R.: Leukocytes in General Paralysis Treated by Radiothermy, Psychiat. Quart. **5**: 432-440 (July) 1931.

16. Kahler, H., and Knollmayer, F.: Ueber die Anwendung von künstlicher Hyperthermie als Ersatzmittel der experimentellen Fiebertherapie, Wien. klin. Wchnschr. **42**: 1342-1344 (Oct.) 1929.

17. Berris, J. M.: The Treatment of Arthritis by Artificial Fever: Preliminary Report of Twenty Cases, J. Michigan State M. Soc. **32**: 355-358 (June) 1933.

18. Simpson, W. M.; Kislig, F. K., and Sittler, E. C.: Ultra High Frequency Pyretotherapy of Neurosyphilis: A Preliminary Report, Ann. Int. Med. **7**: 64-75 (July) 1933.

RATIONALE OF FEVER THERAPY

It has long been noted that the altered conditions incident to some intercurrent, unrelated, generally febrile disease are at times antagonistic to the continuation of a primary illness. Authentic instances are recorded wherein a patient, with for example a previously progressive chronic arthritis, has rather suddenly experienced a prolonged remission, at times a cure: the unexpected gift of an otherwise unwelcomed intercurrent disorder. It has been observed clinically and experimentally that the lowering of body temperature diminishes the resistance of a host, human or otherwise, to certain bacterial infections. There is experimental evidence to support the contention that high temperatures exert a bactericidal and bacteriostatic effect on certain germs in vitro. These observations provided the impetus for a trial of hyperpyrexia in the treatment of various diseases, including arthritis.

PHYSIOLOGIC REACTIONS TO FEVER THERAPY

Regardless of the method used, whether diathermy, radiothermy, hot baths or heated cabinets, the resultant hyperthermia is characterized by more or less identical physiologic effects. These have been summarized by Fatherree [19] and others [20] as follows:

Bacteriolysis.—Gonococci: generally at a temperature of from 106 to 107 F. (Carpenter, Boak, Mucci and Warren [21]).

Streptococci: no data.

Blood Flow.—Pulse rate: increased up to from 130 to 150 beats per minute (Bazett,[22] Bierman,[23] Bishop, Horton and Warren [24]).

Circulatory rate: increased (Bazett,[22] Bierman,[23] Kissin and Bierman [25]).

Cardiac output: increased minute volume output (Bierman [23]).

Blood pressure: initial rise, subsequent fall (Bierman and Fishberg,[20] Bishop, Horton and Warren [24]).

Blood volume: no change, or slight concentration (Bierman and Fishberg,[20] Bischoff, Long and Hill [26]).

Viscosity: no change, if intake is encouraged (Bierman and Fishberg,[20] Tenney [27]).

Nail-bed capillaries: increased in number and size (Tenney [27]).

Blood Cellular Elements.—Erythrocyte count: generally no change (Tenney [27]).

Erythrocytes, sedimentation rate: little or no change (Nicholls, Hansson and Stainsby [28]); increased (Tenney,[27] King,[29] Moen, Medes and Chalek [30]).

Leukocyte count: initial fall, subsequent rise to 15,000 per cubic millimeter (Bierman,[23] Warren and Wilson [31]).

Leukocytes: increased rate of phagocytosis (Warren and Wilson [31]).

Blood Chemistry.—Non-nitrogenous elements (urea, uric acid, creatinine): no change (Karr and Nasset [32]) or slight increase (blood concentration), (Neymann and Osborne,[3] Simpson, Kislig and Sittler [18]).

Sugar, phosphorus, plasma lipoids, serum calcium: no change or slight increase (blood concentration, Neymann and Osborne,[3] Simpson, Kislig and Sittler,[18] Bierman,[23] Walinski,[33] Bischoff, Maxwell and Hill,[34] Bischoff, Ullmann, Hill and Long,[35] McQuarrie and Stoesser,[36] Hopkins [37]).

Inorganic phosphorus converted to organic form (Bischoff, Maxwell and Hill,[34] Bischoff, Ullmann, Hill and Long [35]).

Serum protein: no change (Moen, Medes and Chalek [30]) or increase (Karr and Nasset [32]).

Acid-base equilibrium: altered in the direction of slight alkalosis (Bischoff, Long and Hill,[26] Bischoff, Maxwell and Hill,[34] Bischoff, Ullmann, Hill and Long,[35] Hopkins [37]).

Chlorides: may be marked drop (Simpson [38]).

Oxygen content and capacity of venous blood: increased (Bischoff, Maxwell and Hill,[34] Bischoff, Ullmann, Hill and Long,[35] Goldfelder [39]).

Carbon dioxide combining power: decreased (Bischoff, Long and Hill,[26] Bischoff, Maxwell and Hill,[34] Bischoff, Ullmann, Hill and Long,[35] Hopkins,[37] Nasset, Bishop and Warren [40]).

Blood-Immune Bodies.—Agglutinins: variable data—rise (Reimann [1]) or fall (Ecker and O'Neal [41]).

Complement: no change (Jung and Day [42]); reduced (Bierman and Fishberg [20]).

Opsonic index: no change (Jung and Day [42]).

Gastric Secretion.—Loss of chlorides (Simpson, Kislig and Sittler,[18] Simpson [38]).

Sweat.—Loss of from 18 to 26 Gm. of sodium chloride in from 3 to 4 liters of sweat in each session (Simpson, Kislig and Sittler [18]).

Increased lactic acid content (Bierman and Fishberg [20]).

Urine.—Amount: generally temporary oliguria (Karr and Nasset [32]).

Reaction: Unchanged or slightly alkaline (Karr and Nasset [32]).

Metabolic Rate.—Increased 7 per cent per degree of fever (Berris,[17] Neymann and Osborne,[20] Bierman,[23] Tenney [27]).

Electrocardiogram.—Contractions of lowered voltage (Bishop, Horton and Warren,[24] Wiggers and Orias [43]).

Many of the reactions are of little or no importance from the standpoint either of resultant discomfort or of relief. The benefits of fever therapy presumably arise from: (1) a direct bacteriolytic or bacteriostatic effect due to the influence of heat itself on bacteria (without necessarily implying formation of immune

19. Fatherree, T. J.: Personal communication to the authors.
20. Neymann, C. A., and Osborne, S. L.: Physiology of Electropyrexia, Am. J. Syph. & Neurol. **18:** 28-36 (Jan.) 1934. Bierman, William, and Fishberg, Ella H.: Some Physiologic Changes During Hyperpyrexia Induced by Physical Means, J. A. M. A. **103:** 1354-1357 (Nov. 3) 1934.
21. Carpenter, C. M.; Boak, Ruth A.; Mucci, L. A., and Warren, S. L.: Studies on the Physiologic Effects of Fever Temperatures, J. Lab. & Clin. Med. **18:** 981-990 (July) 1933.
22. Bazett, H. C.: Circulation in Pyrexia, J. A. M. A. **97:** 1271-1274 (Oct. 31) 1931.
23. Bierman, William: Radiothermy: Fever Induced by Short Radio Waves, Brit. J. Phys. Med. **7:** 155-158 (Dec.) 1933.
24. Bishop, F. W.; Horton, C. B., and Warren, S. L.: A Clinical Study of Artificial Hyperthermia Induced by High Frequency Currents, Am. J. M. Sc. **184:** 515-533 (Oct.) 1932.
25. Kissin, Milton, and Bierman, William: Influence of Hyperpyrexia on Velocity of Blood Flow, Proc. Soc. Exper. Biol. & Med. **30:** 527-530 (Jan.) 1933.
26. Bischoff, Fritz; Long, M. Louisa, and Hill, Elsie: Studies in Hyperthermia: Acid-Base Equilibrium in Hyperthermia Induced by Short Radio Waves, J. Biol. Chem. **90:** 321-329 (Jan.) 1931.
27. Tenney, C. F.: Artificial Fever Produced by the Short Wave Radio and Its Therapeutic Application, Ann. Int. Med. **6:** 457-468 (Oct.) 1932.
28. Nicholls, Edith E.; Hansson, K. G., and Stainsby, W. J. Treatment of Rheumatoid Arthritis with Hyperthermia Produced by a High-Frequency Current, J. Bone & Joint Surg. **16:** 69-74 (Jan.) 1934.
29. King, J. C.: Diathermy Hyperpyrexia in Chronic Afebrile Diseases, South. M. J. **25:** 813-818 (Aug.) 1932.
30. Moen, J. K.; Medes, Grace, and Chalek, I.: The Relative Effects of Diathermy and Infection on the Plasma Proteins, Plasma Viscosity and Suspension Stability of the Blood in Dogs, J. Lab. & Clin. Med. **19:** 571-581 (March) 1934.
31. Warren, S. L., and Wilson, K. M.: The Treatment of Gonococcal Infections by Artificial (General) Hyperthermia, Am. J. Obst. & Gynec. **24:** 592-598 (Oct.) 1932.
32. Karr, J. W., and Nasset, E. S.: Physiologic Effects of High Frequency Current: Nonprotein Nitrogen Partition and Secretion of Urine in Anesthetized Dogs, Am. J. Physiol. **107:** 170-177 (Jan.) 1934.
33. Walinski, Franz: Ueber das Verhalten des Blutzuckers und Schweisszuckers bei kunstlicher hyperthermie, Deutsche med. Wchnschr. **2:** 1475-1476 (Sept.) 1932.
34. Bischoff, Fritz; Maxwell, L. C., and Hill, Elsie: Studies on Hyperthermia: III. The Phosphorus Equilibrium, J. Biol. Chem. **90:** 331-339 (Jan.) 1931.
35. Bischoff, Fritz; Ullmann, H. J.; Hill, Elsie, and Long, M. Louisa: Studies on Hyperthermia Induced by High Frequency Electric Current, J. Biol. Chem. **85:** 675-686 (Feb.) 1930.
36. McQuarrie, Irvine, and Stoesser, A. V.: Influence of Acute Infection and of Artificial Fever on Plasma Lipoids, Proc. Soc. Exper. Biol. & Med. **29:** 1281-1283 (June) 1932.
37. Hopkins, H.: Chemical Changes in Blood Induced by Hyperpyrexial Baths, Arch. Neurol. & Psychiat. **31:** 597-604 (March) 1934.
38. Simpson, W. M.: Influence of Radiotherm Pyretotherapy on Chloride Metabolism, J. A. M. A. **100:** 67-68 (Jan. 7) 1933.
39. Goldfelder, Anna: Radiothermy on Oxygen Content and Capacity in Human Blood: The Saturation Point of Hemoglobin with Oxygen, Arch. Phys. Therap. **14:** 339-340 (June) 1933.
40. Nasset, E. S.; Bishop, F. W., and Warren, S. L.: Physiological Effects of High Frequency Current: I. Respiratory Metabolism and Certain Changes in the Blood of Anesthetized Dogs, Am. J. Physiol. **96:** 439-448 (Feb.) 1931.
41. Ecker, E. E., and O'Neal, M. M.: Effect of Hyperpyrexia Induced by Ultra-High Frequency Current on B Typhosus Agglutinin and Complement, Am. J. Pub. Health. **22:** 1050-1054 (Oct.) 1932.
42. Jung, Ruth E., and Day, A. A.: Effect of Diathermy on the Concentration of Complement and Normal Opsonins, Proc. Soc. Exper. Biol. & Med. **28:** 1080-1081 (June) 1931.
43. Wiggers, C. J., and Orias, Oscar: The Circulatory Changes During Hyperthermia Produced by Short Radio Waves (Radiothermia), Am. J. Physiol. **100:** 614-628 (May) 1932.

bodies), (2) an indirect bacteriolytic or bacteriostatic effect resulting from increasing formation or mobilization of immune bodies, (3) a local effect from vasodilatation, providing an augmented blood supply to inflamed tissues, and (4) a general effect from the heightened metabolism incident to fever. An arthritic patient may be helped by any one of these factors acting alone or in combination. It must be admitted that data regarding all these factors, particularly the second, the augmentation of immune bodies, are meager and contradictory. Until more work is done, conclusions are somewhat presumptuous.

Some of the reactions to fever therapy are of no significance as far as benefits are concerned but account for unpleasant side-actions. Most notable of these is that reported by Simpson and his colleagues:[44] marked loss of chlorides from blood and tissues. Patients may lose from 18 to 26 Gm. of chlorides in the 3 to 4 liters of sweat exuded during each session of fever. Thus the amount of chloride lost in sweat may exceed its total quantity in the blood. As a result, free hydrochloric acid disappears from the gastric juice and the blood chlorides may fall 40 mg. or more (100 mg. in one case) per hundred cubic centimeters of blood. Simpson feels that this loss of chlorides is largely responsible for the symptoms of exhaustion, nausea, vomiting, abdominal cramps and muscular twitching that sometimes occur during or after fever sessions, and that these symptoms can be practically eliminated by supplying large quantities (from 2 to 4 liters) of chloride-containing fluids, such as iced 0.6 per cent saline solution orally.

44. Simpson, Kislig and Sittler.[18] Simpson.[33]

Reported Contraindications to Fever Therapy.—The following conditions have been considered to be contraindications to fever therapy: advanced age, myocardial and renal insufficiency, marked hypotension, active tuberculosis, aortic aneurysm, rapidly progressive late neurosyphilis, and abnormal conditions of the skin which interfere with adequate sweating.

THE APPLICATION OF FEVER THERAPY TO THE ARTHRITIDES

Modern methods of fever therapy were applied to arthritic patients about three years after the initial use of such methods in syphilis. The results of fever therapy for chronic infectious (atrophic) arthritis were first reported in 1931 by Markson and Osborne:[45] results for gonorrheal arthritis were first reported in 1932 by Carpenter and Warren[46] and by Bishop, Horton and Warren.[24] Since then, fever therapy has also been used in a very few cases of senescent (hypertrophic) arthritis, gouty arthritis, traumatic arthritis, and neuritis, including sciatica, myositis (fibrositis) and bursitis.

TABLE 1.—*Reported Results of Fever Therapy in Chronic Nonspecific Infectious (Atrophic, Rheumatoid, Proliferative) Arthritis*

Report	Author	Method Used	Dose of Fever Recommended (Fahrenheit)	Total Number and Frequency of Fever Sessions Used	Patients Treated	Results, per Cent: "Cured" "Complete Relief" "Symptom Free"	Marked Relief	Moderate Relief	Little or No Relief	Comment
1	Markson and Osborne [45]	Diathermy	7 to 8 hours at 103 to 104	8 (1 a week)	6	0	33	50	17	
2	King [29]	Diathermy	2 to 3 hours at 102 to 103	* Every 5 to 7 days	*	* "Some"	*	*	*	Sometimes "most striking result"; in some only temporary relief
3	Speed [47]	Diathermy	4 hours at 102 to 103	10 (1 every 2 to 3 days)	*	*	* "Some"	* "Some"	*	
4	Carpenter and Warren [46]	Radiothermy and diathermy†	*	*	*	*	*	*	*	
5	Tenney [27]	Radiothermy	3 to 4 hours at 104 to 106 (rectal)	*	16	25	62‡ "improved"		13	
6	Cecil [57]	*	*	*	*	*	* "Some"		* "Some"	"Results disappointing"
7	Berris [17]	Heated cabinets	2 to 6 hours at 102	9	11	18	36	28	18	
8	Simpson, Kislig and Sittler [18]	Radiothermy and heated cabinets†	5 hours at 105 to 106 (rectal)	10 or less (1 every 3 to 7 days)	*	*	*	*	*	"Gratifying results in some"
9	Kohn and Warren [56]	*	*	1 or 2	43	*	*	80‡	*	Relapses relieved by further treatment
10	Markson and Osborne [47] (second report)	Diathermy	8 to 10 hours at 104 or more	8	19	21	16	26	37	Complete relief in four cases for 15 to 21 months
11	Kovacs [60]	*	Not over 104	*	*	0	50‡		50	"Failures and encouraging results equally divided"
12	Auclair [62]	Diathermy and radiothermy	*	*	*	*	* "Nearly all"		*	
13	Nicholls, Hansson and Stainsby [28]	Diathermy	5 hours at 104.4 (oral)	1 to 5 (1 a week)	12	0	0	25	75	
14	Osborne and Markson [49] (third report)	Inductotherm	8 hours at 104	8 to 20 (1 every 7 days)	*	*	70	*	*	
15	Simpson [1]	Radiothermy and heated cabinets†	5 hours at 104 to 105 (rectal)	2 to 3 (1 every 7 to 14 days)	40	*		* "at least 75"	*	

* Data incomplete.
† Method preferred.
‡ Where the figures are placed between the columns "marked relief" and "moderate relief" the degree of relief obtained was not definitely stated.

FEVER THERAPY IN CHRONIC INFECTIOUS (ATROPHIC) ARTHRITIS

Fifteen reports, by ten groups of workers, on experiences with fever therapy in chronic nonspecific infectious (atrophic, rheumatoid, proliferative) arthritis have appeared since 1931. Methods and results are

45. Markson, D. E., and Osborne, S. L.: The Treatment of Arthritis by Sustained Fever Therapy: A Preliminary Report of Six Cases, Illinois M. J. **60**: 397-403 (Nov.) 1931.

46. Carpenter, C. M., and Warren, S. L.: Artificially Induced Fever in the Treatment of Disease, New York State J. Med. **23**: 997-1001 (Sept. 1) 1932.

summarized in table 1. In some reports data are meager and are frankly based on preliminary impressions.

Method.—Production of fever by means of diathermy ("superdiathermy") was the method used by four groups of workers.[47] Radiothermy was used by Tenney.[27] Of those who have used more than one method, diathermy is preferred to radiothermy by Carpenter and Warren[46] at Rochester, N. Y., whereas Simpson and his co-workers[48] at Dayton, Ohio, prefer air conditioned cabinets to radiothermy. Heated cabinets were used by Berris.[17] Recently, Osborne and Markson[49] and Merriman, Holmquest and Osborne[50] have substituted the use of the "inductotherm" for diathermy.

Those who favor diathermy do so because of the presumably greater expense of radiothermy and the danger of burns from arcing inherent in the latter

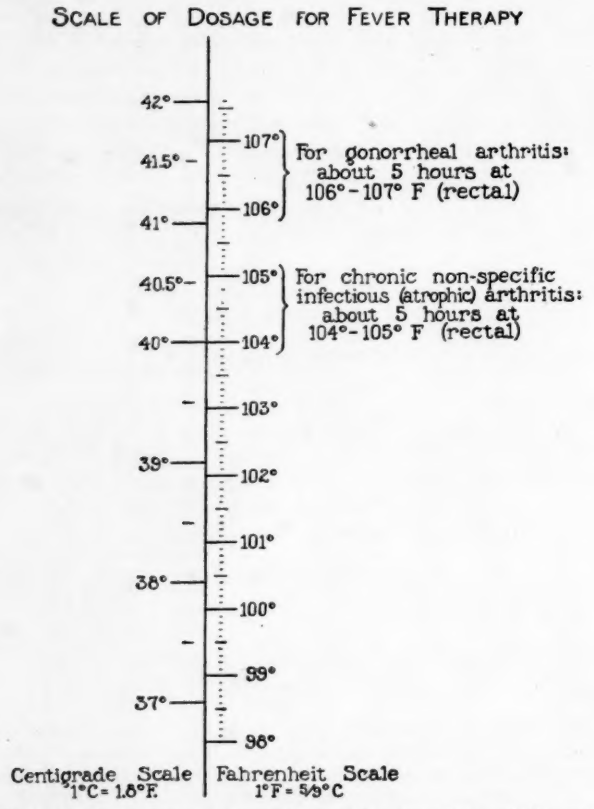


Fig. 1.—Scale of dosage in fever therapy for gonorrheal arthritis and chronic nonspecific infectious arthritis. The authors estimate dosage in terms of rectal temperature (about 1 degree F. higher than the oral temperature). Doses recommended by some investigators are based on oral temperatures, those recommended by others are based on rectal temperatures.

method. This danger can be avoided with care, according to the protagonists of radiothermy, and they insist that patients' reactions to radiothermy are less exhausting and severe than to long sessions of diathermy. Simpson and his colleagues[48] were quite as able to develop and to maintain the desired levels of fever by means of air conditioned cabinets ("Kettering Hypertherm") as with radiothermy, the use of which they have therefore discarded. As a further reaction to expensive and cumbersome apparatus, there is a tendency on the part of some to be content with even simpler methods and to advocate the induction of fever by multiple electric pads and heating blankets,[51] or by long immersion in a hot tub. Thus Coulter,[52] who primarily favors hyperpyrexia by diathermy, uses hot baths to lower the cost of treatments.

The bath water is at an initial temperature of 110 F., except for nervous patients, when it is 106 F. The patient generally remains in the bath one hour. When his temperature has risen to 104 F., the temperature of the bath is reduced to this temperature, 104 F. At the end of one hour in the tub, the patient's fever is maintained for several hours by blankets and hot water bottles.

Coulter considers this method of producing fever simple but not as comfortable as by diathermy, and fever is not maintained as long. Kovacs'[53] plan of hyperpyrexia baths is essentially similar to that of Coulter.

Dosage of Fever.—The recommended "dosages" of fever have differed considerably (fig. 1). Some believe that two, four or six hours at from 102 to 103 F. will suffice for one session; for example, King,[29] who favors diathermy; Speed,[47] who favors diathermy, and Berris,[17] who favors heated cabinets. Others recommend from five to eight hours at 104 to 105 F.: Markson and Osborne[45] (diathermy), Nicholls, Hansson and Stainsby[28] (diathermy), and Simpson[48] (heated cabinets). Temperatures above 105 F. are recommended for patients with chronic infectious arthritis by but few, such as by Tenney,[27] who favors radiothermy. Kovacs[53] believes that such patients do not tolerate well temperatures of more than 104 F.

The great desideratum in fever therapy is to obtain and to maintain a degree of fever that will actually kill, or at least seriously retard the growth of, organisms in vivo and yet be essentially harmless to the tissues of the host. In gonorrheal arthritis, as will be seen later, data on the thermal death time of various strains of gonococci in vitro and in vivo have been determined, and an effective dose of fever has apparently been established. This is not so in chronic infectious (atrophic) arthritis. The cause of the latter disease is of course not yet definitely identified, though it is believed by many to be a streptococcus of some sort, probably of the viridans or hemolytic type. Until information is available concerning the thermal death time of the various arthrotropic streptococci under suspicion, the dosage of fever for this disease can be at the most but guesswork.

Number and Frequency of Fever Sessions.—Earlier workers tried to make two or three sessions of fever suffice; when results were frequently unsatisfactory and symptoms continued, the number of sessions was gradually increased, some insisting that from ten to twenty sessions were required.[54] Recently there has been a tendency to accept the experience of the majority, who favor a total of six to eight sessions of fever as one course of treatment, though some investigators still feel that a smaller number may give as good results. Thus Simpson is of the opinion that two or three treatments, with an interval of one or two weeks intervening, are apparently as effective as a greater number.

47. Nicholls, Hansson and Stainsby.[28] King.[29] Markson and Osborne.[45] Speed, J. S., in discussion on King, J. C.: South. M. J. **25**: 817-818 (Aug.) 1932. Markson, D. E., and Osborne, S. L.: The Treatment of Arthritis by Electropyrexia, Illinois M. J. **64**: 231-237 (Sept.) 1933.

48. Simpson.[1] Simpson, Kislig and Sittler.[18]

49. Osborne, S. L., and Markson, D. E.: Electropyrexia: A Résumé of Therapeutic Applications and Technics, Ann. Int. Med. **7**: 1391-1397 (May) 1934.

50. Merriman, J. R.; Holmquest, H. J., and Osborne, S. L.: A New Method of Producing Heat in Tissues: The Inductotherm, Am. J. M. Sc. **187**: 677-682 (May) 1934.

51. Wilgus, S. D., and Lurie, Leah: The Fever Treatment of Paresis, by Means of the Diathermy Current and the Electric Blanket, Illinois M. J. **60**: 341-344 (Oct.) 1931.

52. Coulter, J. S.: The Treatment of Arthritis, Internat. J. Med. & Surg. **46**: 1-5 (Jan.) 1933.

53. Kovacs, Richard: Physical Therapy in Chronic Arthritis, M. Jour. & Record **138**: 372 (Nov. 15), 398 (Dec. 6) 1933.

54. Speed.[47] Simpson, Kislig and Sittler.[18] Osborne and Markson.[49]

Sessions have been given by some as often as every two to three days, by others only every seven to fourteen days. The usual schedule is one session twice a week. A second course of fever may be advised if symptoms of arthritis persist after an interval of two or three months.

Results.—In considering results reported to date it must be realized that each worker has in general treated only a few patients, only two of the fifteen reports being concerned with more than twenty patients. Percentages of "cures" refer to those patients who were reported as obtaining "complete relief," as becoming "symptom free" for a considerable period of time, or as "cured." "Cures" were obtained by Tenney [27] in 25 per cent of sixteen cases, by Berris [17] in 18 per cent of eleven, and by Markson and Osborne [55] in 21 per cent of nineteen. "Some" of King's [20] patients were cured. The results of Markson and Osborne have varied, presumably with experience. In their first report [45] 33⅓ per cent, or two of six patients, were markedly relieved but none were cured; in their second report [55] 16 per cent, or three, of nineteen patients were markedly relieved by fever induced by diathermy, and 21 per cent, or four patients, were completely relieved for as long as fifteen to twenty-one months. According to their third report,[49] 70 per cent of an unstated number of patients were markedly relieved by the use of the "inductotherm" but none were classified as cured.

It would appear that from 25 to 50 per cent of the patients treated in the various series received only moderate relief, and that no relief was obtained in from 13 to 37 per cent of cases reported by some, and in from 50 to 75 per cent of cases reported by others. Particular attention should be given to the reports of the two larger series: that of Kohn and Warren,[56] who treated forty-three patients, and that of Simpson, who treated at least forty patients. No "cures" are reported by either, but 80 per cent of Kohn and Warren's patients obtained some relief (marked or moderate), and a majority of Simpson's patients obtained either marked or moderate improvement.

To others the results of fever therapy for chronic infectious arthritis have been frankly disappointing. Thus, Cecil [57] believes that the wave of enthusiasm for hyperthermia is not justified. In a limited series (number not stated) no benefit was noted by some, and only a temporary effect was noted by others; in a few cases improvement was apparently permanent. Of twelve patients treated by Nicholls, Hansson and Stainsby,[28] none were cured and none were markedly relieved. Only 25 per cent (three patients) were moderately relieved and 75 per cent (nine) received no apparent benefit.

Summary of Results.—Because several of the investigators have omitted figures, a summary of their total experience cannot be given. Fairly complete data are given (in reports 1, 7, 10 and 13 in table 1) concerning forty-eight cases in which 13 per cent of patients were listed as cured or completely relieved, 18 per cent markedly relieved, 29 per cent moderately relieved, and 40 per cent not benefited. When one adds to these data the figures given in reports 5, 9 and 15 in this table, it would appear that of this total of 147 patients about 7 per cent (ten) were considered as cured or as completely relieved from the activity of the disease. Sixty-six per cent (ninety-eight patients) obtained variable degrees of improvement and 27 per cent (thirty-nine) obtained no appreciable relief. Of those who were variably improved, probably half or less were relieved markedly; the others were benefited moderately.

One may therefore conclude that of all patients with chronic infectious (atrophic) arthritis concerned in these reports approximately 10 per cent (7 per cent minimum and 13 per cent maximum) became symptom free, about 25 per cent were markedly relieved, about 35 per cent were moderately relieved, and about 30 per cent (27 per cent minimum and 40 per cent maximum) received no benefit. In other words, a third of the patients were markedly or completely relieved and two thirds obtained only moderate relief or none at all.

Experience has been insufficient to determine finally which method of production and what dose of fever are most desirable. The analysis of cases has included but scant data on the duration, extension and degree of activity of the arthritic process under treatment. To date there is no clear cut evidence that results are dependent on one particular method or that a "correct dose" has been definitely established. Similarly, wide differences are apparent in the results by the various methods and doses now employed.

FEVER THERAPY FOR GONORRHEAL ARTHRITIS

Since 1932, nine reports have appeared, from six groups of workers, on the effect of fever therapy on gonorrheal arthritis. An analysis of these experiences is given in table 2. As in reports on chronic infectious (atrophic) arthritis, data at present are meager and incomplete, and the number of patients treated by each group of investigators is small, from two to twelve. The same diversity in methods for producing fever is apparent. Regardless of the method used, the reports indicate that rapid sterilization of the joints and the genito-urinary tract can be accomplished if the patient's temperature can be elevated long enough to reach or exceed the thermal death point of the gonococcus.

Fever Sessions: Dose, Number, Frequency.—Some of the handicaps present in the problem of treating chronic atrophic arthritis are not persent in the treatment of gonorrheal arthritis. The causative organism of the latter disease is known, and the thermal death time of the organism having been determined, the matter of dosage can be estimated with considerable accuracy and confidence. The thermal death time of fifteen or more strains of gonococci in vitro has been found by Carpenter, Boak, Mucci and Warren [21] to be about five hours at from 105.8 to 107.6 F. A few strains are more resistant and need the same temperature for longer periods or a higher temperature for shorter periods. Such information is of the greatest help in estimating the dose effective in killing these organisms in vivo. Thus it is recommended by those who have obtained the best results in gonorrheal arthritis that each dose of fever be at least five hours at 106.7 F. (reports 1, 2 and 4, table 2). Others have used an approximate dose (from three to five hours at 104 to 106 F.).

The majority have found that only one to three sessions of fever of five hours at about 106.7 F. are necessary. When smaller doses of fever were used (from two to six hours at 102 to 103.5 F.) from four to six sessions were necessary, and even then the results were not as good as when higher temperatures were reached and maintained. Sessions were given every three to seven days.

55. Markson and Osborne (footnote 47, last reference).
56. Kohn, L. A., and Warren, S. L.: Preliminary Report on the Treatment of Chronic and Subacute Infectious Arthritis by Artificial Fever, J. Clin. Investigation **12**: 971 (Sept.) 1933.
57. Cecil, R. L.: Rheumatoid Arthritis: A New Method of Approach to the Disease, J. A. M. A. **100**: 1220-1227 (April 22) 1933.

Results.—The effects of fever therapy on gonorrheal arthritis have been much more striking than on chronic infectious arthritis. Warren and his collaborators, Carpenter, Bishop, Horton and Wilson,[58] have reported that for the small number of patients treated by them the results have been "very encouraging." Those treated by Carpenter and Warren [46] were "usually cured," although in one case there was complete failure after seven hours of heat at 106.7 F. In this case the thermal death point of the gonococcus isolated from the joint was much higher than the amount of fever given the patient. In those treated by Bishop, Horton and Warren [24] acute arthritis subsided rapidly, redness and tenderness disappeared, and mobility was gradually restored; chronic gonorrheal arthritis became painless and some mobility was regained.

These gratifying results have been corroborated from several sources. Thus Tenney [27] concluded that hyperthermia acts almost as a "specific" for gonorrheal arthritis. He advocates a temperature at 106 F. for three to four hours and believes that the thermal death point of the organism is generally about 104 F. Simpson, and his colleagues Kislig and Sittler,[18] who have treated twelve patients, stated that "the results were uniformly successful." Seven of eight patients treated by Atsatt and Patterson [59] were completely relieved after from one to five sessions of fever, even though the doses of fever were smaller (five hours or less at temperatures not more than 103.5 F.) than those deemed necessary by others. Their one patient who was not relieved was admittedly given a temperature that was too low. An inadequate amount of fever was also the probable cause of failure in the treatment by Berris [17] of one patient with "extremely active gonorrheal infection."

The majority of patients treated have had acute or subacute gonorrheal arthritis but, in addition to Bishop, Horton and Warren,[24] Kovacs [60] has also noted "good results even in stubborn chronic gonorrheal arthritis."

Summary of Results.—As data are incomplete, the total number of cases concerned in these nine reports cannot be calculated. Of thirty-three cases mentioned, data on results in twenty-four cases can be tabulated. Of these twenty-four patients with gonorrheal arthritis, apparently twenty-two (92 per cent) were promptly and "completely relieved" or "cured." Failure resulted in only two cases (8 per cent) and was due, as stated, to an inadequate dose of fever.

FEVER THERAPY FOR OTHER FORMS OF ARTHRITIS AND "RHEUMATISM"

Those forms of joint diseases which have so far come within the scope of fever therapy have been chiefly cases of chronic nonspecific infectious arthritis and gonorrheal arthritis. However, certain other types of "rheumatism" have also been similarly treated. There are, of course, many types of arthritis. Aside from arthritis due to specific infections, trauma and gout, the two major types are commonly designated as chronic "infectious" (atrophic, proliferative or rheumatoid) arthritis and chronic senescent (hypertrophic, degenerative or osteo-) arthritis. Differentiation of these two more common types is important, as their course and the prognosis are quite different and it is likely, therefore, that their causes are not identical.[61]

Senescent (Hypertrophic) Arthritis.—Although senescent (hypertrophic) arthritis is not generally characterized by as widespread, as deforming or as painfully

TABLE 2.—*Reported Results of Fever Therapy in Gonorrheal Arthritis*

Report	Author	Method Used	Dose of Fever Recommended (Fahrenheit)	Total Number and Frequency of Fever Sessions Used	Patients Treated	Results, per Cent: "Cured"	Marked Relief	Moderate Relief	Little or No Relief	Comments
1	Carpenter and Warren [46]	Diathermy and radiothermy†	5 to 7 hours at 106.7	1 or 2	*	*	*	*	*	"Gonorrheal arthritis usually cured"
2	Bishop, Horton and Warren [24]	Diathermy and heated cabinet	5 hours at 106.7 to 107 (rectal)	2	9	*	*	*	*	"Results very encouraging; joints become painless"
3	Tenney [27]	Radiothermy	3 to 4 hours at 104 to 106 (rectal)	*	*	*	*	*	*	"Acts almost as a specific"
4	Warren and Wilson [31]	*	5 hours at 106.7 (rectal)	1 or 2	2	100				
5	Berris [17]	Heated cabinet	2 to 4 hours at 102 to 103	4 to 6	2	50	..	..	50	Case of extremely active gonorrheal infection unrelieved; case "probable gonorrheal arthritis" of 6 months' duration, completely relieved
6	Simpson, Kislig and Sittler [18]	Radiothermy and heated cabinet†	5 hours at 105 to 106 (rectal)	*	*	*	*	*	*	"Results gratifying"
7	Atsatt and Patterson [59]	Diathermy and heated cabinet	2 to 6 hours at 103.5 (oral)	*	8	88	..	22	..	"In failure temperature given was too low"
8	Kovacs [60]	*	*	*	*	*	*	*	*	"Good results even in stubborn chronic gonorrheal arthritis"
9	Simpson [1]	Radiothermy and heated cabinet	5 hours at 105 to 106.8 (rectal)	* One every 7 days	12	100	..	..	..	"Results uniformly successful in acute cases"

* Data incomplete.
† Method preferred.

58. Bishop, Horton and Warren.[24] Warren and Wilson.[31] Carpenter and Warren.[46]
59. Atsatt, R. F., and Patterson, Luella E.: The Use of Electropyrexia in Gonorrheal Arthritis, Physiotherapy Rev. **13:** 144-146 (July-Aug.) 1933.
60. Kovacs, Richard, and Kovacs, Joseph: Physical and Constitutional Measures in Chronic Arthritis, New York State J. Med. **33:** 1148-1154 (Oct. 1) 1933.
61. Primer on Rheumatism: Chronic Arthritis, Chicago, American Medical Association, 1934. Hench, P. S., and Jepson, P. N.: Differential Diagnosis and Medical and Orthopedic Care of Several Different Forms of Chronic Arthritis, M. Clin. North America **10:** 563-595 (Nov.) 1926.

progressive lesions of joints as may appear in chronic infectious (atrophic) arthritis, the disability and pain that it produces may at times be most annoying and constitute a considerable handicap. At the onset of symptoms of this disease its victims are generally more than 40 years of age, often more than 50, a time when physicians prefer to apply conservative measures and hesitate to provoke sudden and marked alterations in an accustomed vascular status. Nevertheless, in a number of cases of "hypertrophic arthritis," fever therapy has been employed with reported safety.

Of forty-seven patients with "hypertrophic arthritis" who were treated by Tenney [27] with radiothermy, three (6 per cent) became "symptom free" in an unspecified time, thirty-eight (82 per cent) were "improved," and six (12 per cent) were unimproved. Berris [17] subjected four patients, from 49 to 76 years of age, who had "osteo-arthritis" of from three to twenty years' duration to artificial fever therapy by means of heated cabinets. Each patient was subjected to from seven to twelve sessions of fever at 101 to 102 F. for two to three hours. A woman, aged 76, who had suffered with arthritis for twenty-three years, obtained "marked relief from nocturnal pain" and lost her painful sensitivity to changes in weather. The other three patients obtained little or no improvement. Among those treated by King [29] were patients with "hypertrophic arthritis," who obtained relief from pain, and increased articular mobility, by means of diathermy hyperpyrexia for two to three hours at 102 to 104 F.

According to Simpson,[1] however, patients with hypertrophic arthritis are poor subjects for this form of therapy, as many of them have cardiovascular and renal insufficiency. Simpson treated twenty-three (?) patients with this type of arthritis, with disappointing results. They did not seem to tolerate the treatments well and any relief obtained was transient.

Summarizing this rather small total experience in the treatment of hypertrophic arthritis by fever therapy we find that, of the total of seventy-four patients enumerated in the various reports to date, only three (4 per cent) became symptom free, thirty-nine (53 per cent) obtained "improvement," and thirty-two (43 per cent) experienced little or no relief.

Gouty Arthritis.—A man, aged 44, with chronic gout of three years' duration, was treated by Berris [17] with fever therapy when rest, physical therapy and diet had failed to relieve him and after he had been unable to walk for four months. Six treatments of two hours each at 103 F. were given over a period of three weeks. He obtained complete relief and was able to walk without pain after the second treatment. Auclair [62] is also credited with good results in the treatment of gout. No details are given.

Traumatic Arthritis.—Berris [17] also treated two patients with traumatic arthritis. "Complete relief" was obtained in both cases. The first was a case of lumbosacral injury of three months' duration, on account of which the patient had been bedridden for six weeks, without relief from strapping of the back and baths. The second was one of traumatic sacroiliac arthritis associated with constant pain of two years' duration, which was not relieved by a belt. Each patient received five treatments.

Miscellaneous Types of "Arthritis."—Results in cases designated simply as "arthritis," "chronic arthritis" or "mixed arthritis" without any further attempt at differentiation have not been included in the foregoing analyses. Fifteen patients with "chronic infectious and noninfectious arthritis" were treated by Bishop, Horton and Warren [24] with an average of less than two sessions of fever in each case. All were "definitely benefited." Twenty patients with "mixed infectious and hypertrophic arthritis" were included among those helped by Simpson.[1] For his patients with "chronic arthritis" who were so treated, Kinsella [63] noted only "temporary relief." Coulter,[52] however, concluded that fever therapy is a valuable adjunct in the treatment of "certain cases of arthritis."

Great success was claimed by Auclair [62] in his treatment of eighty patients with "rheumatism" of various types: "ankylosing arthritis, various forms of monarthritis, even arthritis of the hip, polyarthritis, infectious monarthritis, gout, sciatica and neuritis, neuralgia, torticollis, lumbago and vertebral arthritis." There were supposedly only seven complete failures.

Neuritis, Sciatica, Myositis, Bursitis.—In addition to cases ascribed to Auclair, a few patients with neuritis, myositis and bursitis have been treated by Tenney. Of six patients with neuritis so treated, five became symptom free and one was improved. Of eight patients with myositis, two became symptom free and six were improved. Of four patients with bursitis, two became symptom free and two were improved.

FEVER THERAPY AT THE MAYO CLINIC

Material and Method.—In 1932 Sheard, Pratt and Hench [64] treated a number of patients with arthritis by localized radiothermy. Instead of subjecting the patient's entire body to the high frequency current, the apparatus was so arranged that only the affected joint came within the electric field. Thus it was hoped to avoid systemic reactions and yet affect perhaps the viability of the presumed invading organisms through a marked local hyperthermia. Results seemed inconclusive and, on the whole, inadequate.

In October 1933 four "Kettering hypertherm cabinets" were installed through the courtesy of Mr. Charles F. Kettering, director of the research laboratories of the General Motors Corporation and Dr. Walter Simpson of Dayton, Ohio. Since then, with the collaboration of Dr. Arthur U. Desjardins, we have treated therewith sixty-six patients who had chronic, nonspecific infectious (atrophic) arthritis and sixteen who had gonorrheal arthritis.

Application of Method: Apparatus.—The Kettering hypertherm is a large air conditioned cabinet (fig. 2) through which heated humidified air is forced by a gentle current induced by a pair of electric blowers. The air is heated by three electric-strip heaters of a total of 1,500 watts and the heat of the cabinet is controlled by a thermostat. It is humidified by a container of water heated by a pair of electrodes and its humidity is controlled at about 35 to 40 per cent by a humidostat. The walls of the cabinet are made of celotex, an adequate insulator, and the cabinet's superstructure fits snugly into position on its couchlike base, preventing any escape of heat. Small sliding doors in the sides of the cabinet give access by which the patient's protective covering of blankets can be rearranged, his skin temperature noted or his rectal temperature taken. The rectal temperature is taken every ten to fifteen minutes; mouth temperatures are not reliable because the patients frequently sip cold water.

Management of Patient.—General physical examination of the patient is supplemented by a special detailed examination

62. Auclair, cited in Results from Use of Electropyrexia in France, Paris letter, J. A. M. A. **101:** 1403 (Oct. 28) 1933.

63. Kinsella, R. A.: Types of Chronic Rheumatism, J. A. M. A. **101:** 345-348 (July 29) 1933.

64. Sheard, Charles; Pratt, C. R., and Hench, P. S.: Unpublished data.

of his joints (fig. 3) and by certain chemical analyses. He is admitted for treatment in the morning without breakfast and is wheeled on the couch-like base into the cabinet proper, which has previously been heated to about 125 F. The patient having become accustomed to this temperature in a few minutes, the temperature is permitted to rise to about 145 F. The patient's temperature begins to rise and, after about thirty to forty-five minutes, he may begin to be restless. Sedatives are then given, but sparingly. In the early stage of a session of fever, 3 grains (0.2 Gm.) of sodium amytal or from 1½ to 3 grains (0.1 to 0.2 Gm. of pentobarbital sodium is given. Later codeine, rarely

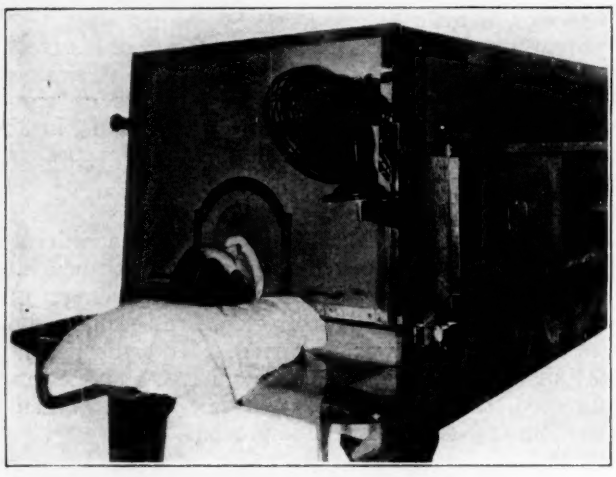


Fig. 2.—A patient in the "Kettering hypertherm."

morphine, is sometimes given hypodermically. Others have sought to minimize the "restless period" by giving patients as a routine rather large doses of amytal and morphine, together, just before the beginning of the treatment or at the onset of the restlessness, or at both times. It is our belief, however, that the depressing reactions, cyanosis and impending collapses reported by some are frequently due not so much to the patient's reaction to fever as to his reactions to excessive amounts of the sedatives themselves, perhaps in conjunction with fever. Using minimal amounts of sedatives at intervals during sessions of fever we have had practically no experience with significant depression of vascular tone or mental irritability.

After about an hour the patient's temperature has generally risen to the desired level that is to be maintained. It can be raised faster, but only with great discomfort to the patient. We consider the optimal rectal temperature for cases of chronic infectious arthritis to be about 104 to 105 F. for five hours, and for cases of gonorrheal arthritis to be about 106 to 106.8 F. for five hours (figs. 1, 4 and 5). When the patient's rectal temperature has reached the desired level, additional blankets are placed over him. The temperature of the cabinet can then be adjusted to maintain the bodily temperature at this level for the required number of hours. The patient's head, which is of course outside the cabinet, is cooled by an adjacent electric fan and by frequent sponging with cold water. He is encouraged to sip iced 0.6 per cent saline solution more or less continuously, and from 3 to 4 liters is prescribed to prevent symptoms of chloride depletion. The drink does not taste objectionably salty to the patient who is being treated by fever therapy.

Patients vary considerably in their ability to tolerate fever therapy. A nervous, apprehensive patient may soon request that treatment be stopped and may need considerable jollying and encouragement from the attendant, with recourse to sedatives as necessary. Many patients relax and go to sleep for short periods. Music by means of a radio or phonograph serves to distract and to sooth some, to irritate few. The attendant's personality is a real factor in procuring an adequate and well borne session of fever. Seeing a complacent patient already in the cabinet will sometimes suffice to allay a candidate's apprehension. When the required dose of fever has been given, the patient is removed from the cabinet and allowed to rest until his temperature returns to normal (in from sixty to ninety minutes), after which he takes a warm, and then a cool, shower and is allowed to go home. We have found hospitalization generally unnecessary.

Psychic Reactions to Fever Therapy.—Of sixty-six patients with chronic infectious arthritis and sixteen with gonorrheal arthritis, only six of the former and none of the latter were unable to tolerate the sessions of fever. Three of these six were unable to complete the initial session and three abandoned treatment after two or three sessions because of discomfort, which in most cases is due to a poor tolerance to heat. In some cases the patient's reaction to heat seems inconsequential but a psychic reaction is noted, a degree of claustrophobia, and patients insist that they "want to get out of the cabinet." One of our patients, who had previously been subjected to febrile reactions from typhoid vaccine given as foreign protein therapy, said he preferred them to cabinet hyperthermia because, although he got more relief from the latter, he could enjoy with the former "the luxury of threshing around freely in bed."

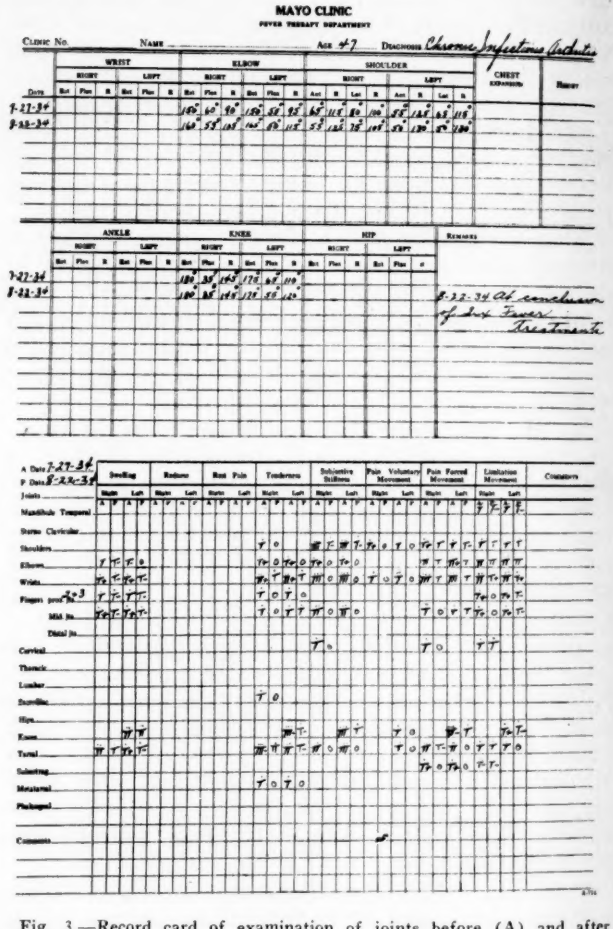


Fig. 3.—Record card of examination of joints before (A) and after (P) a course of fever therapy: upper, motion in affected joints; lower, symptoms and signs referable to affected joints (graded 1 to 4 according to severity).

Physiologic Reactions to Fever Therapy.—The pulse rate generally rises to between 130 and 140 beats per minute when the maximal temperature is attained and then falls to between 120 and 130 and remains near this level for the remainder of the period of sustained temperature. If the pulse rate increases to 160 or more, remaining at this level for an hour, treatment is discontinued.

In a series of readings of blood pressure taken before and after 100 treatments, 28 per cent showed a drop of

from 20 to 40 mm. of mercury in the systolic pressure, and 37 per cent showed a drop of from 20 to 50 mm. of mercury in the diastolic pressure. Throughout the treatment a tendency of the pulse pressure to increase gradually was usually apparent. When the systolic pressure drops below 80 mm. of mercury and the pulse pressure below 30 mm. of mercury, treatment should be discontinued at once.

The body weights of 100 patients (eighty-two with arthritis, eighteen with other complaints) were taken

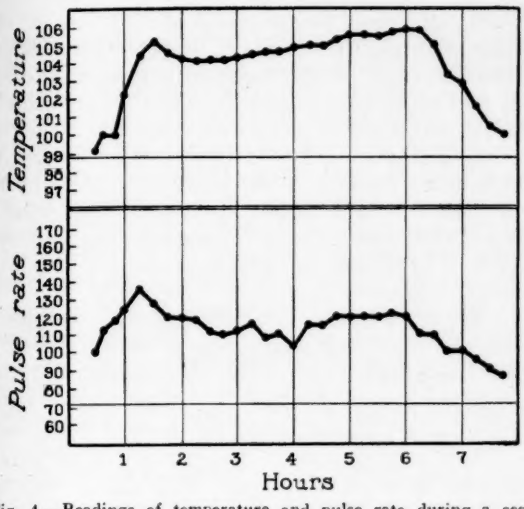


Fig. 4.—Readings of temperature and pulse rate during a session of fever for chronic infectious arthritis.

before and at the conclusion of their courses of fever therapy. Contrary to popular notion the majority did not lose weight: 79 per cent gained from one-half to 6 pounds (0.2 to 2.7 Kg.); 21 per cent lost similar amounts. Loss of weight was due in most instances to vomiting or to inability to take a sufficient quantity (from 3 to 4 liters) of fluids. Nausea complicates treatment in about 20 per cent of cases. Vomiting occurs immediately after the sessions of fever in about 10 per cent of cases; the vomiting often terminates the nausea. In about 3 per cent of cases, protracted anorexia and nausea and frequent vomiting may be encountered for from twenty-four to forty-eight hours, but this condition can be promptly overcome by the intravenous administration of from 500 to 1,000 cc. of 10 per cent dextrose and 10 per cent saline solution.

When care is taken and the patient is kept covered with a light cotton blanket, burns on the skin are not observed at body (rectal) temperatures of from 104 to 105 F.; but when a rectal temperature of from 106 to 107 F. is necessary, as in cases of gonorrheal arthritis, superficial vesicles may develop on the skin if the patient does not remain covered.

Chemical Reactions to Fever Therapy.—Determinations of blood lactic acid, made in twenty cases before and after treatment, were within normal limits. Determinations of blood urea in sixty cases, made before and after treatments, were within normal limits. Determinations of blood chlorides in eighty-two cases before and after treatment were within normal limits. (Chlorides by mouth were given to all. The 21 per cent of patients who lost weight are included in the latter group.) Counts of erythrocytes in 100 cases showed no appreciable variation except in two cases, in which there was a drop of about 500,000 cells per cubic millimeter immediately after the first session. In each of these cases the lowered level attained after the first treatment was maintained for the remainder of the series of treatments. Leukocyte counts were made before and after treatments in eighty cases. There was an increase ranging from 2,000 cells to as much as three times the original count in 69 per cent of the cases. The greatest variation occurred usually in sessions demanding higher temperatures. In the remaining 31 per cent the counts after treatment varied slightly from those before treatment. Determinations of values for hemoglobin were made in 100 cases: there were no appreciable differences before and after treatment.

AUTHORS' RESULTS WITH FEVER THERAPY FOR CHRONIC INFECTIOUS ARTHRITIS

In order to evaluate the results as judiciously and as independent of the patient's subjective reactions as possible, a detailed examination was made, eight characteristics of each affected joint being noted on a special form. At intervals between sessions of fever and at the end of the course a similarly detailed reexamination was made (fig. 3). After a period of from six to fourteen months since the last session of fever, the present status of sixty patients (thirty-six men and twenty-four women) has been determined. Their average age was 36 years (the youngest was 10, the oldest 61). The average duration of arthritis was six and a half years (from one month to seventeen years). The activity of the disease was mild (grade 1) in seven cases, moderately severe (grade 2) in forty-five cases, and severe (grade 3) in eight cases. Thus most of them were ambulatory, but painfully so. The joints involved were few (extension grade 1) in fifteen cases, several (extension grade 2) in thirty-three cases, and many (extension grade 3) in twelve cases.

Immediate Results.—At the immediate conclusion of the course of treatment 17 per cent (ten patients) had experienced marked (grade 3) improvement, 46 per cent (twenty-eight patients) had obtained moderate

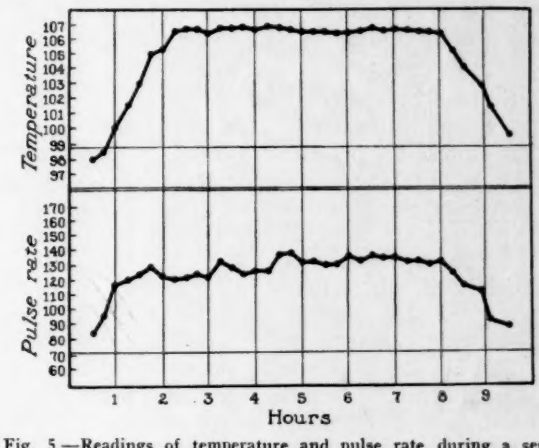


Fig. 5.—Readings of temperature and pulse rate during a session of fever for gonorrheal arthritis.

(grade 2) but not striking improvement, 27 per cent (sixteen patients) had obtained but slight (grade 1) relief, and 10 per cent (six patients) had received no relief. None were relieved completely.

According to Pope,[65] "arthritics may have their pains and stiffness greatly increased at first" with fever therapy. Our patients experienced no aggravation of symptoms.

65. Pope, Curran: A Clinical Study of Pyretotherapy (Fever Treatment), Kentucky M. J. **30**: 593-605 (Nov.) 1932.

Some have stated that patients who have obtained only moderate relief on the immediate conclusion of their course may with some confidence look for improvement to increase, and that they must not expect to note a full effect for several months. Our evidence does not wholly support this optimism. Of the six patients who were not improved at the end of their session, none were better six months or more later. Of the fifty-four patients who had received variable degrees of improvement, thirty-three later lost some ground: nine lost only part of what they had gained but twenty-four lost it all. Twelve patients were able to maintain, but noted no augmentation of, improvement. Only nine of the sixty patients noted progressive improvement.

TABLE 3.—*Fever Therapy for Chronic Infectious Arthritis: Relation of Authors' Results to Duration of Disease*

Cases	Duration of Arthritis, Years	Improved, per Cent	
		Grade 2	Grade 3
8	1 year or less	37	50
7	1 to 2	43	25
25	3 to 5	16	8
16	6 to 10	31	6
4	Over 10	0	25

Later Results.—At the time of the present inquiry, generally eight to eleven months, and in no case less than six months after completion of treatments, the later results of fever therapy are as follows: Fifty per cent (thirty patients) were apparently no better than before fever therapy, 12 per cent (seven patients) had obtained but slight (grade 1) relief, 20 per cent (twelve patients) had obtained definite (grade 2) though not outstanding improvement, and 18 per cent (eleven patients) had obtained marked (grade 3 to 3+) improvement. While none were entirely symptom free or considered themselves "cured," three of the last eleven patients were "practically well." A man, aged 48, whose moderately active and rather extensive arthritis had been of eighteen months' duration, "can now do most anything" and is "almost normal." Another man, aged 32, who had had arthritis only six months before treatment, has had "no swelling and very little pain or stiffness since." He attends dances frequently and walks freely. A third man, aged 48, considers himself "practically cured." Whereas he "couldn't do anything before the treatments," he "can do almost everything now without pain." Not one of these three patients had had any treatment of any sort since fever therapy over a year ago.

Practically all the patients had experienced exacerbations of variable degrees since fever therapy, even those who had obtained and maintained considerable relief. All but ten of the sixty patients had seen fit to resume treatments of variable types since fever therapy. Two of them had accepted foreign protein treatments by means of typhoid vaccine given intravenously. One was not relieved thereby; the other declared he got more relief from them than from fever therapy.

Relation of Results to Number of Sessions of Fever.—Although an attempt was made to give each patient six treatments, the number of treatments varied. A few felt sufficiently improved after three sessions and wished to postpone the rest. Others who noted but little improvement with the earlier sessions persisted and took the full course. Of the sixty patients, thirty-eight had six sessions, one had seven, five had five, four had four, and twelve had three sessions. Although results doubtless depend in part on giving a reasonable number of sessions, other factors, such as the duration and activity of the disease, are more important. This is evidenced by the fact that of those who had only three sessions, 50 per cent obtained notable (grade 3 to 3+) improvement, whereas none of those who had five sessions and only 13 per cent (five of thirty-eight patients) of those who got six sessions obtained similar relief.

RELATION OF RESULTS TO DURATION, ACTIVITY, AND EXTENSION OF THE ARTHRITIS

As with all other forms of treatment for chronic infectious arthritis, the results of hyperthermia depend to a marked extent on the duration and activity of the disease, and more so on these factors than on whether the patient has four or six fever sessions. Thus the shorter the duration of the arthritis (table 3) and the less its activity (table 4), the more chance there was that the patient would receive an impressive (grade 3) response. There were exceptions, of course, and occasional cases of short duration resisted therapy more stubbornly than some of longer duration.

The number of joints involved was not an apparent factor in the result. Notable results were received as often by those with many affected joints as with few.

Relation of Result to Age of Patient.—The age of the patient when treated bore no obvious relationship to the effect of treatment. The group of patients in the decades between the third and sixth, inclusive, shared alike in obtaining both the moderate and marked results.

AUTHORS' RESULTS IN FEVER THERAPY FOR GONORRHEAL ARTHRITIS

Sixteen patients have completed their courses of treatment; thirteen were men, three women. Their average age was 31 years (the youngest was 15 and and the oldest 59). Nine were suffering from acute, and seven from chronic, gonorrheal arthritis. All had experienced acute arthritis shortly after the onset of an acute urethral or pelvic infection. In ten cases urethral smears made at the clinic were positive for gonococci; in six cases smears were negative here but reliable reports of recently positive smears were given us. The average duration of arthritis was thirteen days in acute cases, twelve months in chronic cases.

TABLE 4.—*Fever Therapy for Chronic Infectious Arthritis: Relation of Authors' Results to Degree of Activity of Disease*

Cases	Activity of Disease, Grade	Improved, per Cent	
		Grade 2	Grade 3
7	1	14	57
45	2	22	13
8	3	37	0
0	4		

At the beginning of treatment at the clinic the activity of the arthritis was very severe (grade 4) in five cases, severe or marked (grade 3) in four, moderate (grade 2) in five, and mild in two. Many of the joints were exquisitely tender, markedly swollen and indurated, and they were held completely or almost entirely immobile because of pain. The joints were thus in general much more painfully affected than in the cases of chronic infectious arthritis. The joints involved were generally few (one or two) in about twelve cases, but more numerous in four.

Immediate Results.—In our earlier cases from five to seven sessions of fever were given. In later cases, at least of the acute type, from three to four sessions were given, as this number seemed to suffice, as it also did in cases of chronic gonorrheal arthritis. Relief, which is sometimes marked, is often noted after the first session. Of the sixteen patients, on conclusion of their last session of fever, 32 per cent (five) were completely relieved of all signs and symptoms of arthritis (table 5). An additional 37 per cent (six patients) were also completely relieved except for rather insignificant residual stiffness, slight (grade 1) pain of a joint on motion or walking, or slight (grade 1) residual tenderness. Nineteen per cent more (three patients) were markedly relieved (grade 3), and one patient (6 per cent) was moderately relieved. Only one patient (6 per cent) did not obtain benefit, a case of residual chronic gonorrheal arthritis of seven months' duration, with roentgenographic evidence of destructive arthritis and with marked stiffness of the knee but with only a little tenderness and a normal sedimentation rate.

As would be expected, patients with acute arthritis, whose disease is of shorter duration, received somewhat more striking results than those with chronic gonorrheal arthritis, especially those with considerable residual stiffness and destruction of joint tissues. Of those with acute arthritis, 88 per cent were promptly

TABLE 5.—*Immediate Results of Fever Therapy for Gonorrheal Arthritis*

Relief Grade	Acute Arthritis, per Cent	Chronic Arthritis, per Cent	Average for Both Groups, per Cent
4	44	14	32
3+	44	29	37
3	12	29	19
2	..	14	6
1	..	..	..
None	..	14	6
Total cases	9	7	16

"cured" or practically so (grade 3+ and grade 4 improvement), being relieved of all significant pain, swelling, tenderness and stiffness. Of the seven patients with chronic gonorrheal arthritis, whose disease was of three, three, six, seven, eight, fourteen and thirty-six months' duration respectively, all were markedly relieved but the one previously mentioned. One was completely relieved and two others were practically relieved. Of these seven patients, three had marked stiffness and destructive arthritis, in each case of a knee; two still had considerable active inflammation, with tenderness, redness and pain. After treatment these symptoms subsided completely, leaving only residual stiffness, as was to be expected. As noted, the one patient with marked residual stiffness but with little if any active disease was not benefited.

These figures apply to the effect of fever therapy on articular infections. In the majority of cases, genital infections were likewise benefited and urethral smears became negative. At times, however, the urethral infections were resistant and extra sessions of fever or other treatment, such as the Elliott regimen, had to be used. For details concerning this phase of the problem, reference is made to the paper by Desjardins, Stuhler, and Popp.[66]

Later Results.—In eleven of the sixteen cases, from three to fourteen months has elapsed since treatment. The status of the patients has changed but little and they have lost none of their improvement. Thus five of them (45 per cent) are still symptom free. Five (45 per cent) are markedly relieved and experience but slight, occasional aching. The one who was unrelieved at the end of the sessions of fever has seen but little improvement (grade 1).

66. Desjardins, A. U.; Stuhler, L. G., and Popp, W. C.: Fever Therapy for Gonococcic Infections, J. A. M. A. **104**: 873 (March 16) 1935.

COMMENT

Since our results with the Kettering hypertherm are approximately the same as those obtained with other methods, we agree with Simpson that the use of properly heated cabinets should replace more elaborate methods. Certainly this method is simpler and less expensive than radiothermy. Simplification of methods to avoid danger and expense and to increase the sphere of hyperthermia's usefulness is highly desirable. We regard as justified the lessening popularity of radiothermy and "superdiathermy" in favor of heated cabinets. Simplification must not be carried, however, to the point of therapeutic ineffectiveness. There is already a tendency to propose methods of supposed "fever therapy" incapable of providing adequate degrees of fever or of producing much more than the local thermic reactions of ordinary physical therapy.

The results in gonorrheal arthritis are in striking contrast with those in nonspecific infectious arthritis, the figures in the two groups being almost the converse of each other. Of patients with gonorrheal arthritis, well over two thirds are promptly "cured" and practically none go without considerable relief. Of patients with chronic infectious arthritis, about two thirds get little or no relief and only a third are benefited significantly. It is a point for debate how far fever therapy is justified in cases of chronic infectious arthritis if it but infrequently provides more than relief of grade 2. Many less expensive, more available and less strenuous forms of therapy do that much almost as a routine. Based on experiences to date, it seems only fair to tell a candidate for fever therapy who has chronic infectious arthritis that his chances for having the progress of his disease stopped sharply are probably no more than one in five, if that much, and that his chances of receiving little or no benefit are about 50 per cent. If his condition is of long duration or markedly active, or if he has practically ignored older and more orthodox measures, it would seem best to postpone a trial of fever therapy in favor of current therapy of proved usefulness. But it is in just such long-standing and severe cases that one turns in hope to new methods. If the victim has tried other measures faithfully with but little success, if he understands the likelihood of relief, and if he can afford the treatments without undue financial sacrifice, then a trial of hyperthermia seems quite justified. It must be remembered, however, that success is more frequent in cases of short duration and of moderate activity.

Regardless of the apparatus or method used, such therapy will probably never be inexpensive or cheap, for its physiologic effects are potent and it must always be completely under control. The constant presence of trained attendants is required, with a physician either in attendance also or within immediate call.

In gonorrheal arthritis, results are so striking and apparently so superior to those obtained by other methods that one can prescribe fever therapy as the method of choice with considerable assurance. Even though the cost is a matter of consideration, the prompt relief obtained and the avoidance of crippling defor-

mity, formerly so often a feature of gonorrheal arthritis, fully justify the expense. In a case of doubtful etiology, in which gonorrhea is suspected but cannot be proved, the patient should be given the benefit of the doubt and subjected to two or three adequate sessions of fever. If a striking result is obtained promptly, the chances are that the cause was indeed the gonococcus. Even in cases of old, chronic gonorrheal arthritis in which the continued presence of viable gonococci may seem remote and secondary invaders are under greater suspicion, a trial of a few sessions of fever is nevertheless in order, and particularly if appreciable degrees of inflammatory activity (tenderness, swelling, and pain on motion) still accompany the residual deformity. The "fire" may finally be stopped by fever therapy, but fever therapy should be looked on as a "fire brigade" and not a "corps of carpenters": it may extinguish the fires of gonorrhea but will not restore the architecture of a joint. Therefore, when a process is practically burned out except for residual stiffness, fever therapy is probably not indicated.

The difference between results for the two types of arthritis would seem to support the contention that, in gonorrheal arthritis, fever therapy exerts a direct (sterilizing) effect but that in nonspecific infectious arthritis its effect is largely if not entirely indirect. If the latter disease is bacterial in origin, its causative germ (streptococcus or otherwise) is obviously not one mortal to the degrees of fever available in clinical hyperthermia. A corollary of this would be that if any of the supposed arthrotropic bacteria put forth as being the primary etiologic agent are found capable of being fairly readily killed in vitro at temperatures available in fever therapy, they are probably not the cause of the disease and claims for them should be discarded. Such a conclusion seems only logical. Practically nothing is known about the thermal death time of streptococci, a field for immediate investigation if rational dosage in hyperthermia is to be attempted. Indeed, similar investigations on the thermal death time of all organisms pathogenic to man would seem indicated to determine their susceptibility not to a few minutes of intense heat in vitro but to several hours at lesser temperatures in vivo. It would be a grim joke if of all such pathogenic organisms only one was susceptible to the direct action of hyperthermia. Fever therapy may yet prove "specific" for more than the gonococcus.

SUMMARY AND CONCLUSIONS

A survey of experiences with fever therapy for various types of arthritis indicates that results have been quite variable. No one method has been proved clearly superior to all others, and a laudable process of simplification of methods is in progress.

Of cases of chronic, nonspecific infectious (atrophic) arthritis, "cures" have been reported in from 0 to 25 per cent, marked relief in from 0 to 7 per cent, moderate relief in from 25 to 50 per cent, and no relief in from 13 to 75 per cent. We have estimated that, of the total number of patients treated, an average of about 10 per cent were reported as becoming symptom free, about 25 per cent reputedly obtained marked relief, about 35 per cent obtained moderate relief, and about 30 per cent obtained no relief.

The results in our cases have not equaled these general averages but have approximated the more modest estimates. Of our sixty patients with chronic infectious arthritis none were completely relieved, 18 per cent were markedly relieved, 12 per cent were moderately relieved, 20 per cent were but slightly benefited and 50 per cent were not relieved. Thus a total of 30 per cent received significant benefit and 70 per cent got little or no relief.

The value of fever therapy for chronic infectious arthritis cannot yet be fully appraised. Further clinical experience is necessary as well as further investigation on the thermal death time of supposedly etiologic bacteria. In the meantime, a trial of fever therapy in selected cases is justified.

Of cases of gonorrheal arthritis, "cures" have been reported in from 50 to 100 per cent, with complete relief occurring in a total average of 92 per cent. Only occasional patients are not markedly benefited.

Our results in sixteen cases of gonorrheal arthritis confirm those of others. About 90 per cent of our patients were essentially cured or markedly relieved. Adequate fever therapy seems to provide a direct sterilizing action on affected joints.

Since one may expect from adequate fever therapy a fairly rapid and essentially complete recovery in the majority of cases of acute gonorrheal arthritis (without the articular residues that so frequently occur in spite of other measures), and since even in cases of chronic, but still active, gonorrheal arthritis considerable benefit can often be obtained, the prompt use of this form of therapy is recommended.

THE DIAGNOSIS AND TREATMENT OF BLACK SPIDER BITE

J. M. FRAWLEY, M.D.
AND
H. M. GINSBURG, M.D.
FRESNO, CALIF.

During the last seven years, fifty-two cases of black spider bite have been treated at the Fresno County General Hospital. Most of the cases were admitted during the summer and early fall. The number treated each year was as follows: 1928, 6; 1929, 3; 1930, 3; 1931, 6; 1932, 11; 1933, 12; 1934, 11.

In the average case the patient was an adult male who had been bitten on the penis or scrotum while sitting in an outdoor privy. In some cases, however, there was a history of having been bitten on the foot while putting on a shoe in the morning or on the back or arm after getting into the blankets at night.

The patient when brought to the hospital shortly after being bitten complains of pain and swelling at the site of the injury with pain throughout the body, particularly in the extremities, which become cramped and spastic. This is soon followed by severe pain over the abdomen and rigidity of the abdominal muscles, with nausea and frequently vomiting. Sometimes he complains of burning of the soles of the feet. There is anxiety, headache, ringing in the ears and dizziness. The blood pressure is elevated as much as 35 or 40 mm.

If the injury is slight, only tenderness and cramping of the muscles of the extremities may be noted. The location of the bite determines the rapidity of the abdominal involvement. When the lower extremities or the scrotum are bitten there is more rapid development of abdominal symptoms. The spasm of the muscles in the extremities is always noted previous to the abdominal symptoms.

The physician's attention is particularly drawn to the severe pain in the abdomen. On palpation he finds a

tender abdomen without any point of localization and a rigidity that at times is boardlike and makes him suspicious of a ruptured peptic ulcer.

The spider that is responsible for this syndrome is Latrodectus mactans, the female of which species is known as the Black Widow. It is a large shiny black spider with spherical body and long slender legs. On the ventral side of the abdomen is an hour glass shaped red or yellow spot. The dorsal surface is usually marked by one or more small red dots.

This spider is common in many of the Southern states, where it is found around refuse heaps and in stables and outbuildings but occasionally also in houses both in the country and in cities.

J. T. Vaughan [1] of Ashland, Va., who has had ten cases, recently writes: "These cases are quite a new thing in this part of Virginia. I have two explanations for this: First, the past two years have been very dry and, second, the state board of health has installed sanitary privies and a large number of bites have occurred in privies. Apparently the spider, seeking a damp place, stays in privies."

It is generally considered that the bite of the black widow spider is very dangerous, if not fatal. In the records of the Fresno County General Hospital, however, there have been no deaths in adults from black spider bite. Bogen,[2] who compiled records of sixty cases seen at the Los Angeles General Hospital, says that among them there was no mortality. According to him there have been twelve deaths recorded in the literature but no autopsy was performed in any cases so that death might have been due to some other cause.

Kobert [3] considers that certain factors might modify the effect of black spider bite. He points out that the poison of the spider may become exhausted after several bites so that for a while little may be left for succeeding bites and also that the poison might enter a blood or lymph vessel with dangerous results or it might remain in the upper layers of the epithelium and do no harm.

There are several other factors that might affect the outcome:

1. It is likely that individual resistance varies greatly, one person being more susceptible than another to the toxalbumin injected by the spider.[4]

2. Since the toxin has a quantitative effect, the size of the individual bitten is an important factor. The amount of poison that would be relatively harmless in an adult might conceivably be fatal in an infant or small child. In children the symptoms are more severe and the outlook is grave. It is a common opinion among physicians practicing in Fresno that fatal cases of black spider bite are not uncommon in small children. In young children there is a rapid development of convulsions, which are extremely difficult to control.

3. While the prognosis in adults is favorable, nevertheless improper treatment may alter the outcome. Alcohol seems to be contraindicated and fatal cases have been reported that may be due to this cause.

A. M. Cornwell [5] of Lincolnton, N. C., in referring to an article published by him in 1931 says: "It is interesting to note that since the above paper was given I have had a death from spider bite. This case is interesting from the fact that the man was partially intoxicated at the time he received his spider bite. He was fishing on the banks of a river and became rather suddenly and seriously ill and his partner discovered one of the black widow spiders up his pants leg, unknown to him. Three days later the man was dead despite all our efforts to save him, having had the classic symptoms of arachnidism."

The successful management of cases of black spider bite depends on two factors: correct diagnosis and proper treatment.

DIAGNOSIS

It is essential that a correct diagnosis be made; otherwise the patient might be subjected to a surgical operation for an acute condition of the abdomen such as ruptured gastric ulcer. If one is on guard it is always possible to differentiate between the abdominal symptoms in spider bite and those of an acute condition of the abdomen. There is generally a history of having been bitten by a black spider and there is no previous ulcer history. The patient is not in shock and the temperature and pulse are normal. The blood examination shows a slight elevation of the white count, with little increase in polymorphonuclear leukocytes.

TREATMENT

In former years many different forms of treatment were employed. For some reason, strychnine was given and the discomfort and pain of the patient was thus unduly prolonged. The most valuable form of treatment was the administration of sedatives, chiefly morphine.

Bogen has advocated the use of blood serum obtained from patients after recovery from spider bite and also the administration of tetanus antitoxin. These measures have not seemed to be necessary in the average case and were not used in this series.

The most rational form of treatment is one based on the clinical picture, which resembles hypertension in the adult and eclampsia in the child; viz., intravenous administration of magnesium sulphate. This treatment was mentioned by Bogen as having been used once in a series of sixty cases described by him in 1932. He says that "the intravenous injection of a 10 per cent solution of magnesium sulphate was given in one instance, with some apparent relief of symptoms." He makes no further comment about it.

The first extensive use of magnesium sulphate in the treatment of spider bite was made in 1933 by De Asis.[6] He treated successfully four cases of bites by the red spider (Katipo), a member of the Lactrodectus family occurring in the Philippines. It was his report which prompted us to apply this treatment to the bite of the black widow spider.

Since the appearance of his paper, the routine treatment for patients admitted with black spider bite at the Fresno County General Hospital has been as follows:

1. The patient is immediately put to bed and iodine is applied to the site of the bite.

2. A soap suds enema is administered, and fluids are given freely by mouth.

3. Morphine sulphate is given hypodermically to control the pain and sodium amytal to insure rest.

1. Vaughan, J. T.: Personal communication to the authors; Arachnidism: Report of Two Cases, Virginia M. Monthly **57**: 806 (March) 1931.

2. Bogen, Emil: Poisonous Spider Bites, Ann. Int. Med. **6**: 375-388 (Sept.) 1932; Arachnidism, Arch. Int. Med. **38**: 623-632 (Nov.) 1926.

3. Kobert, R.: Beitrage zur Kenntniss der Giftspinnen, Stuttgart, Ferdinand Enke **13**: 191, 1901, quoted by Riley and Johannsen.[4]

4. Riley, C. V., and Johannsen, O. A.: Handbook of Medical Entomology, Ithaca, N. Y., Comstock Publishing Company, 1915.

5. Cornwell, A. M.: Personal communication to the authors; Arachnidism, South. Med. & Surg. **93**: 885 (Dec.) 1931.

6. De Asis, Cesareo: "Red Back" Spider Bite and Magnesium Sulphate Treatment: Clinical Study of Four Cases, Am. J. Trop. Med. **14**: 33 (Jan.) 1934.

4. Magnesium sulphate, a 20 cc. ampule of 10 per cent solution, is given intravenously, to be repeated as required to overcome the hypertension and the spasticity of the muscles.

Results with this form of treatment have been very satisfactory. Last summer we used it in eleven cases. It was never necessary to give more than one dose of magnesium sulphate. The patients were usually free from symptoms within twenty-four hours.

2014 Tulare Street.

THE EFFECT OF OIL OF PEPPERMINT ON THE EMPTYING TIME OF THE STOMACH

H. I. SAPOZNIK, M.D.
R. A. ARENS, M.D.
JACOB MEYER, M.D.
AND
HEINRICH NECHELES, M.D., PH.D.
CHICAGO

The effect of oil of peppermint on gastric secretion in man and dog is described and balloon tests of gastric motility after oil of peppermint are reported elsewhere.[1] Our previous work showed that oil of peppermint diminished gastric acidity. It was important, therefore, in the analysis of the factors concerned in such a diminution of acidity to investigate the effect of the oil of peppermint on the emptying time of the stomach.

Wallace and Jackson [2] found that oil of peppermint in the intestine influences gastric secretion by reflex action. Meyer and Gottlieb in their textbook [3] state that carminatives increase the muscular activity of the alimentary canal. Muirhead and Gerald [4] found that small amounts of volatile oils increase the motility of isolated segments of intestine and that larger doses decrease it. In Cushny's textbook [5] it is stated that volatile oils relax the musculature of the stomach and intestine. Gunn [6] likewise reported that carminative volatile oils depress the motility of isolated stomach and intestine. Rehfuss and his associates [7] gave 100 Gm. of "soft creamy wafers with strong peppermint flavor" and noted increased acid secretion but delayed emptying of the stomach. "Soft creamy wafers of strawberry flavor" were given as a control. Samples of gastric contents were taken every fifteen minutes till the stomach was empty. Plant,[8] using dogs with gastric and intestinal fistulas, reported that spirit of spearmint brought into the intestinal loop increases its tone and contraction. Later Plant and Miller [9] published experiments on segments and strips of intestine in vitro. Small doses of peppermint increased their motility and tone; larger amounts inhibited it. Stross [10] reported that menthol inhibited motility and depressed and abolished the tonus of isolated pieces of intestine. Arnold [11] found a paralyzing action of peppermint on the stomach and a stimulating action on the intestine. Sommerfield, Kuenzel and Todd [12] observed under the fluoroscope that peppermint increased the amplitude and vigor of the contractions of the stomach.

METHODS

The methods used in this investigation were as follows:

1. *The Balloon Method.*—A balloon [13] and a stomach tube were introduced through the mouth into the stomach of patients (with duodenal ulcers) or normal students who had been without food for twelve hours. In dogs with a gastrostomy, the balloon and stomach tube were introduced through the cannula.[14] The contractions of the resting stomach were recorded by a water manometer in the usual way. After a sufficient control period, oil of peppermint in amounts varying from 2 to 100 cc. was injected at one time, at intervals, or by continuous drip (all through the stomach tube). The usual amount given was from 2 to 4 cc., but 100 cc. was given only once to a dog. Oil of peppermint, U. S. P., was used.

2. *Duodenal Cannula Method.*—A dog with a wide metal cannula in the stomach and another one in the duodenum was kept on a standard diet. He had been without food but with water for from eighteen to twenty-four hours preceding each experiment. Before the test, the stomach and duodenum were emptied by opening the two cannulas. If food was found in the stomach, no test was done. A rubber tube 40 cm. long was introduced distally into the duodenum and jejunum through the duodenal cannula and was connected with a funnel that was covered with a wire mesh. The dog was fed 250 Gm. of fresh hamburger with 100 cc. of water. After that, the duodenal cannula was opened and the mixed gastric and duodenal secretions were collected. The following day, oil of peppermint was introduced into the stomach immediately after the meal. This was done through a small tube in the gastric cannula. The volume of secretions was measured every ten minutes and the liquid part returned into the intestine through the funnel and rubber tube. The amount of undigested meat was measured and not returned.

3. *Fluoroscopy.*—The patients were six young women from Mandel Clinic who had no gastro-intestinal complaints and were all normal, except possibly patient 4, who had gastroptosis without symptoms. They had been without food for nineteen hours. The subjects received a barium sulphate-milk meal and the stomachs were examined before the fluoroscope at ten minute intervals until emptying was complete. The oil of peppermint was added to the barium meal or given in capsules, always in the dose of 2 cc. There was no difference in results noted between the two modes of giving the oil of peppermint. Controls with 2 cc. of olive oil instead of oil of peppermint were made.

Aided by the Louis L. Cohn Fund.
Valuable assistance in the technical part of this work was given by Mr. Arthur Pilon.
From the Gastro-Intestinal Laboratory, Department of Physiology, the Department of Roentgenology, and the Stomach Study Group, Michael Reese Hospital.

1. (*a*) Meyer, Jacob; Scheman, Louis, and Necheles, Heinrich: Studies on the Action of Oil of Peppermint on the Secretion and Motility of the Stomach in Man, Arch. Int. Med., to be published. (*b*) Necheles, Heinrich, and Meyer, Jacob: On the Inhibition of Gastric Secretion by Oil of Peppermint, Am. J. Physiol. **110:** 686 (Jan.) 1935.
2. Wallace, G. B., and Jackson, H. C.: Am. J. Physiol. **8:** xvii, 1903.
3. Meyer, H. H., and Gottlieb, R.: Pharmacology, Translated by J. Taylor Halsey, Philadelphia, 1915, p. 211.
4. Muirhead, A. L., and Gerald, F. G.: J. Pharmacol. & Exper. Therap. **8:** 253 (May) 1916.
5. Cushny, A. R.: Pharmacology and Therapeutics, ed. 7, 1918, p. 39.
6. Gunn, J. W. C.: J. Pharmacol. & Exper. Therap. **16:** 39 (Aug.) 1920.
7. Miller, R. J.; Bergeim, Olaf; Rehfuss, M. E., and Hawk, T. B.: Am. J. Physiol. **53:** 65 (Aug.) 1920.
8. Plant, O. H.: J. Pharmacol. & Exper. Therap. **16:** 39, 1921.
9. Plant, O. H., and Miller, G. H.: J. Pharmacol. & Therap. **27:** 149 (March) 1926.
10. Stross: Arch. f. exper. Path. u. Pharmakol. **95,** 1922.
11. Arnold, W.: Monatschr. f. Kinderh. **30:** 225 (June-July) 1925.
12. Sommerfield, W. A.; Kuenzel, W. M., and Todd, T. W.: J. Lab. & Clin. Med. **17:** 151 (Nov.) 1931.
13. Carlson, A. J.: The Control of Hunger in Health and Disease, Chicago, University of Chicago Press, 1916 and 1919, p. 35.
14. Kestner, O.: Die Methodik der Dauerfisteln des Magen-Darmkanals, in Abderhalden: Handbuch der biologischen Arbeitsmethoden.

RESULTS

1. *The Balloon Method.*—The results were entirely negative. There was no change in the height, type or frequency of the normal hunger contractions in man or dog when small and probably physiologic doses of oil of peppermint were used. Neither was there a change noted between the duration of the intervals of rest and the activity of the stomach.[1a] Fifteen tests were performed on thirteen patients with peptic ulcer and five tests were done on a gastrostomized dog. In man, less than 10 cc. of oil of peppermint and in the dog less than 4 cc. produced no change in motility in eleven trials, and in only one instance did motor depression occur. Large quantities decreased motility in six tests and produced no change in another two.

2. *Duodenal Cannula Method of Kestner.*—In three duplicate tests with meat-water alone and meat-water plus oil of peppermint, it was found that while the stomach emptied semidigested food and secretions into the duodenum for three and one-half hours after the feeding of meat and water only, this process was practically terminated in the case of meat and water plus 2 cc. of oil of peppermint in two and one-half hours. In the case of the control most of the undigested meat was emptied by the stomach in the first three hours after feeding, and most of the secretion and the digested meat were likewise poured out of the duodenal cannula during the first three hours, while in the same experiment, with the addition of the oil of peppermint, the bulk of the nondigested meat and secretion plus digested meat appeared within the first two hours after feeding.

From table 1 it is apparent that there is a slight diminution in the digestion of meat in the stomach under the influence of oil of peppermint (18 per cent) and less secretion of digestive juices (26 per cent).

3. *Fluoroscopy.*—The barium-oil of peppermint mixture was taken easily. There was a slight complaint by a few of the subjects against the strong peppermint flavor. When the oil of peppermint was given in gelatin capsules, the patient noted the taste (or odor) of oil of peppermint after a few minutes.

TABLE 1.—*Emptying Through Duodenal Cannula*

Hours After Feeding	Liquid, Cc.		Solid, Cc.	
	Control	Peppermint	Control	Peppermint
1	266	273	39	92
2	373	290	55	73
3	248	80	56	12
3½	30	39	0	0
Total	917	682	150	177

In all six subjects there was antiperistalsis during or after the first twenty minutes, which the subjects noticed as nausea. After that, peristaltic waves were seen running from the middle of the body of the stomach toward the pylorus, which quickly emptied the stomach. In controls with olive oil (2 cc.) no antiperistalsis or nausea was noticed. The emptying time of the stomach varied from 240 to 260 minutes in subjects 1, 2, 3, 5 and 6, and was 310 minutes in subject 4 (gastroptosis without symptoms). Olive oil did not appreciably change the emptying time of the stomach as compared to the control, except in subject 4. Oil of peppermint produced a shortening of the emptying time of from 100 to 145 minutes; expressed as percentage of the controls, from —42 to —49 per cent, with an average of —46 per cent. It is interesting to note that subject 4, although having a longer emptying time with barium alone (310 minutes, as compared to the other five subjects with from 240 to 260 minutes), had the same reduction of emptying time after barium-oil of peppermint as the other five subjects.

Since some of us have had the experience that peppermint candy or peppermint cordial gives relief after too heavy a meal, this was put to a test in one of the subjects. The ordinary barium meal was given and the emptying time determined (240 minutes). In the next tests, immediately after drinking the barium meal the subject chewed up a roll of chocolate candy, and on the following day a roll of peppermint candy of the same brand and size, the two of which the patient liked equally well. While after the chocolate candy there was hardly any change (210 minutes), there was a considerable diminution of emptying time after the peppermint candy (150 minutes; i. e., —38 per cent). Similar results were obtained after the patient took 100 cc. of 7 per cent alcohol (195 minutes) and 100 cc. of 7 per cent alcohol plus 2 cc. of oil of peppermint (135 minutes; i. e., —44 per cent).

TABLE 2.—*Emptying Time of the Stomach in Six Normal Female Subjects (In Minutes)*

Subject	Date of Test, 1933	Barium Control	Barium Plus Olive Oil	Barium + Oil of Peppermint	
				Time	Per Cent Change
1	12/16 to 12/30	240	215	140	—42
2	12/16 to 12/30	250	225	130	—48
3	12/16 to 12/26	260	220	140	—46
4	12/16 to 12/26	310*	230	165	—47
5	12/16 to 12/26	240	210	140	—42
6	12/16 to 12/26	255	220	145	—49
Average 1 to 6		249	220	143	—46

* Omitted from average of barium controls.

COMMENT

Peppermint as oil of peppermint, in peppermint candy or in alcohol, undoubtedly has a decided motor action on the stomach as compared to the controls olive oil, chocolate candy and alcohol. It is not easily explainable why this peculiar action was not found in the balloon tests. It is believed that the following may explain it: The hungry stomach has already its own rhythm and the oil of peppermint is not able to augment it. Action on an empty stomach is probably different from that on a full stomach, during hunger and after meals. The tests done on the dog (meat plus oil of peppermint) point to this, but further experimentation will be needed to clear up this point more thoroughly.

The surprising shortening of the emptying time of the stomach with oil of peppermint explains the popular use of oil of peppermint and its use as a constituent of a great number of official and proprietary stomach remedies. The shortening of emptying time after peppermint candy and peppermint alcohol explains the popular habit in this country of offering peppermint candy or peppermint cordial after dinners. In view of our experimental observations, this habit seems to be useful especially after a heavy meal with high fat content, which delays the emptying of the stomach. Oil of peppermint may counteract this delay and make the person feel less full and distended. In a previous paper [1a] it was reported that oil of peppermint diminishes gastric acidity. This may add to the beneficial action of the drug in heartburn after meals.

Rehfuss's [7] results are contrary to our observations, but the great amount of candy eaten and the high pep-

permint content of it may explain this. It was found in our tests that oil of peppermint may produce antiperistalsis. Rehfuss did only one such test on one subject.

The shorter emptying of the stomach does not appreciably diminish the digestion of meat (— 18 per cent, table 1), although it slightly depresses gastric and duodenal secretions (— 26 per cent, table 1). Another observation made in the course of this work by the roentgenologists is worth mentioning. At fluoroscopic examinations of patients, when the observer is waiting for the duodenal bulb to fill, there is often a delay in the emptying of the barium from the stomach into the duodenum by pylorospasm. When a small amount of oil of peppermint is given in gelatin capsules, immediately after solution of the gelatin the barium empties into the duodenum. This study is being continued.

SUMMARY

Dogs fed oil of peppermint with a meat meal showed shortening of the emptying time of the stomach, as compared to the control of three and one-half hours, observed with the duodenal cannula method of Kestner.

In six normal young female subjects the addition of 2 cc. of oil of peppermint to a barium-milk meal shortened the emptying time of the stomach by 46 per cent (fluoroscopy). Peppermint candy and peppermint flavored alcohol had the same effect in one of these subjects.

Twenty-Ninth Street and Ellis Avenue.

ARTIFICIAL FEVER THERAPY IN THE TREATMENT OF CORNEAL ULCER AND ACUTE IRITIS

PRELIMINARY REPORT

E. L. WHITNEY, M.D.

DETROIT

Ophthalmologists for over twenty years have used nonspecific proteins in the treatment of certain eye diseases. The height of fever produced has served, at least in part, as a guide to the degree of the reaction. In the use of typhoid vaccine, Howard noted several years ago that fever was essential to a good result. In the last year my associates and I have had an opportunity to use artificial fever alone as a means of therapy in a sufficient number of eye conditions to warrant reporting the results thereby obtained.

Kettering hypertherm [1] machines were installed more than a year ago in our clinic for experimental work in the treatment of syphilis (principally neurosyphilis), multiple sclerosis, gonorrhea, pelvic peritonitis and arthritis. This apparatus consists of an air conditioned cabinet with which the patient's temperature can be elevated rapidly and maintained at a desired level and carefully controlled for an extended period of time. The entire body, excepting the head, is placed in the cabinet. Mild sedatives are used to keep the patient as comfortable as possible. An electric fan cools the head.

Eight cases presenting varying types of corneal ulcer and six cases of acute iritis are here reported. The results suggest that there is merit in this form of fever therapy, in which the height of the fever and its duration are under such perfect control. Some of the patients received different types of medication during the fever treatment as well as before, while others had fever therapy only.

From the Division of Ophthalmology, Henry Ford Hospital.

1. Through the courtesy of Dr. Charles F. Kettering.

ARTIFICIAL FEVER THERAPY IN CORNEAL ULCER

CASE 1.—*History.*—H. S., a man, aged 36, a laborer, while passing through a building where scrap wood was being unloaded, Aug. 2, 1934, felt a small particle fly into his right eye. He was sent to the factory hospital, where a foreign body was removed from the cornea and the eye was padded. An ulcer developed, which was treated at the factory for thirteen days before he was sent to our outpatient clinic. Another twelve days of treatment followed. This consisted of atropine 1 per cent, silver nitrate 1 per cent to the lids, saline irrigations, and 1 : 5,000 corrosive mercuric chloride ointment. Since no improvement occurred, the patient was admitted to the Henry Ford Hospital for artificial fever therapy.

Examination.—There was a central corneal ulcer 2 mm. in diameter. The edges were irregular and moth eaten, simulating the dendritic type of ulcer. The iris was well dilated with atropine. The general physical examination was negative.

Course.—August 29 the patient was placed in the fever cabinet and a rectal temperature range of from 103.6 to 106.4 F. was maintained for five hours. The ulcer began to improve and in four days after this single treatment it was healed.

Subsequent Course.—November 2, five weeks after the previous discharge from the hospital, the patient returned with a recurrence of the ulcer. Another fever treatment on November 3 was given with a rectal temperature range of from 105.6 to 106.8 F. for five hours. The patient was discharged the next morning and returned on November 8 for his third treatment. The fever range was again from 105.6 to 106.6 F. for five hours. Following these treatments there was definite improvement and by November 13 the ulcer was again healed. During the second recurrence no other medication was given except fever therapy. The patient has remained well to the present time.

CASE 2.—*History.*—J. L., a man, aged 45, a laborer, was injured, Aug. 15, 1934. He noticed an eye irritation and went to the factory first aid station, where no foreign body was found. A corneal ulcer developed, which was treated at the factory hospital for four days. August 19 he was referred to us for treatment.

Examination.—The conjunctiva showed marked chemosis. There was a central corneal ulcer 3 mm. in diameter with undermined smooth margins. Hypopyon and iritis were present. The eyeball showed normal tension to finger palpation. The general physical examination, including blood, urine and search for focal infection, was negative

Course—The patient was treated with mild silver protein 10 per cent, atropine 1 per cent and hot compresses with saline irrigation. No foreign protein was administered. Fever therapy was instituted the next morning with a rectal temperature range from 104.6 to 106 F. for two hours. This seemed to have no effect on the ulcer. Four days later a second fever treatment was given with a rectal temperature from 104.6 to 106 F., for four hours. The ulcer did not progress after this, but since there was no observable improvement the electric cautery was used. A third fever treatment was given on the sixth day, following which the ulcer began to heal and in two weeks was entirely well.

CASE 3.—*History.*—A. W., a man, aged 25, a laborer, worked around blast furnaces and said that he often got something in his eyes. Once previously he had a corneal ulcer in the left eye, which persisted for three weeks before it healed. He complained of a similar condition.

Examination.—There was a small ulcer near the limbus at 6 o'clock, and just above this was a larger one with irregular margins and bad appearance. The lids were inflamed. The pupil was regular and not unduly contracted. The iris was not injected. The vision was not reported. No etiologic factor could be found.

Course.—The patient was first seen June 30, 1934, when treatment in the outpatient department was instituted. This treat-

ment consisted of atropine 1 per cent, silver nitrate to the lids, metaphen in oil 1:500, saline irrigations, and corrosive mercuric chloride 1:5,000. These medications were used over the period from June 30 to July 23, when the patient reported either daily or every other day for treatment. As progress was unsatisfactory, fever therapy was tried. July 23 the patient was given a treatment with the fever ranging from 105 to 106 F., rectally, for five hours. There was immediate improvement and in eight days the ulcer was healed. August 11 the vision was 6/30. Prior to this attack the patient states that his vision was also 6/30, when an examination elsewhere was made for glasses. Slit lamp examination revealed a rather marked interstitial scarring in the area of the healed ulcer.

CASE 4.—*History.*—H. L., a man, aged 26, a dentist, was cleaning teeth, when a piece of tartar flew into the right eye. He washed the eye and gave no further consideration to it. Early the next morning he came to us complaining of pain and photophobia.

Examination.—There was a small abrasion seen, on staining with fluorescein, at the center of the cornea. No foreign body was found. The lids were treated with 1 per cent silver nitrate and 1:5,000 corrosive mercuric chloride, and the eye was padded. In three days a definite ulcer formed in spite of daily antiseptic treatment. The ulcer was about 1 mm. in diameter and had an infiltrating edge. It was thought best to admit him to the hospital for fever therapy. His general physical examination was essentially negative.

Course.—Fever therapy was given, April 30, 1934. The rectal temperature range was from 104.4 to 106.6 F. for five hours. Two days later the ulcer was healed. During this post-therapy period the patient was using 15 per cent mild silver protein and 1:1,000 metaphen alternating hours during the day.

CASE 5.—*History.*—M. K., a woman, aged 55, a housewife, came to the hospital, Sept. 28, 1928, with a small catarrhal ulcer of the left eye. October 5 she appeared with a similar ulcer on the right eye. April 2, 1934, another marginal ulcer developed on the right eye. This was treated with 2 per cent silver nitrate and 25 per cent mild silver protein in glycerin, and water was used to flood the entire eyeball while the lids were held apart for from one to two minutes at each treatment. Corrosive mercuric chloride 1:5,000 was also used. The pupil was kept dilated with homatropine. April 19, seventeen days later, the actual cautery was resorted to. May 2, within twenty-four hours, three more ulcers had appeared. It was decided to admit the patient to the hospital for fever therapy. She had been for several years under the care of the metabolic division of the hospital and was receiving proper diet and thyroid extract for a recognized hypothyroidism. No focus of infection was found. No protein therapy was given.

Examination.—The right eye at the time of the first fever therapy presented three marginal ulcers at 11, 3 and 5 o'clock. The original one at 9 o'clock had practically healed. The general appearance of the cornea was steamy, the epithelium edematous and rough. Tension to finger palpation was normal. The pupil was well dilated with atropine.

Course.—The patient was admitted immediately for fever therapy. The fever ranged from 105 to 107 F., rectally. The duration of the treatment was four and a quarter hours. Two days later the ulcers were receding but there was still much infiltration of the corneal margin. There was, however, no longer any pain. After another two days a second treatment was given in which the fever range was from 104.2 to 107.2 F., rectally, for five hours. Two days after this treatment the ulcers were practically healed. May 18 the eye was quite clear and the patient went home.

CASE 6.—*History.*—T. W., a man, aged 65, a laborer, had been struck in the left eye with a piece of steel in February 1934. This was removed and a roentgenogram was negative for further foreign body in the eye. He recovered from this without apparent difficulty and was comfortable until ten days before admission, when the eye became sore and inflamed.

Examination.—The cornea had a hazy appearance and on staining there were several small points of ulceration. The iris was swollen and discolored. The vision was not recorded. Roentgen examination was again negative for a foreign body. A general physical examination was negative.

Course.—Atropine 1 per cent was instilled and a satisfactory dilatation of the pupil obtained. No other medication was employed. July 5, 1934, fever therapy was given and a rectal temperature range of from 105.4 to 106.2 F. for five hours was obtained. The patient did not tolerate this treatment well, as there was a marked fall in blood pressure, with an associated hematemesis, suggesting a myocardial failure. July 6, the patient was much improved physically. The corneal epithelium was intact and the cornea presented less infiltration. July 13, the corneal epithelium was still healed but there was scarring. The patient returned, August 8, for a check of his glasses. The vision of the affected eye was less than 6/60, because of the interstitial scarring.

CASE 7.—*History.*—S. J., a boy, aged 15 years, in school, came to the hospital, October 9, with an ulcer of the left eye. It began five days before, when he noticed photophobia, pain, lacrimation, and the feeling of a foreign body in the eye. This eye had been injured previously but the scar had not interfered with vision, as a refraction and glasses had given a vision of 6/6 according to his hospital record. There was a history of a swollen knee in 1931, and a tonsillectomy in 1924. His mother had died of tuberculosis.

Examination.—There was a breaking down of the old corneal scar in the upper quadrant of the left eye. Infiltration had extended, occupying the upper half of the cornea. The physical examination revealed some tonsillar tags and carious teeth. The chest was clear, and the blood and urine were normal.

Course.—The pupil was dilated with atropine and the lids were treated with 1 per cent silver nitrate. The boy was admitted to the hospital the next day, October 10, for fever therapy. The rectal temperature range was from 101.8 to 102.8 F., for five hours. It was impossible to increase the fever at this treatment. October 15 there was improvement, and on October 16 the ulcer was practically healed, one small point still taking a stain. October 18 there was still a small area not healed. The patient was returned for another fever treatment, October 19. Again the temperature could be raised only to from 102 to 103.2 F. for five hours. October 25 the cornea was entirely healed. The boy returned November 14 and later had the tonsil tags removed and the carious teeth extracted. His vision one month later was 6/6.

CASE 8.—*History.*—R. W., a man, aged 37, a laborer, had ulceration of the right cornea, which started in January 1934, and of the left eye, which started in April 1934. These ulcers have continued to the present time, January 1935. Before coming to the Henry Ford Hospital Clinic the man had been thoroughly treated. Various standard treatments, including chemical and actual cauterization, had been tried. Foci of infection, including tonsillectomy, had been carefully checked. Incidentally, with the tonsillectomy, his asthma disappeared and has not returned.

Oct. 27, 1934, Dr. R. J. Coyle of Windsor, Ont., referred the patient to this clinic for artificial fever therapy.

Examination.—The lower half of the left cornea presented a destruction of the epithelium with scarring and vascularization and an actively advancing margin. The right eye presented a similar picture, with the right half of the cornea practically gone. The vision was 6/30 in each eye. The lens, iris and fundus of each eye appeared normal. The general physical examination was practically negative. The basal metabolic rate was —14 per cent. The sinuses were clear. The tonsils were small recurrent tags. The urinary tract was normal. Both upper and lower jaws were edentulous. X-ray films showed no retained root fragment. The blood Wassermann reaction was negative and there was no anemia. Skin reactions were negative for allergy. There was no suggestion of tuberculosis.

Treatment.—Thirteen fever treatments were given, extending from Oct. 27 to Dec. 13, 1934. Some of these were given at intervals of from three to four days, while others were a week or so apart. The temperature range for each treatment was from 104 to 106 F. for a period of five hours. After these treatments no very definite change could be seen in the eyes, and fever therapy was finally abandoned.

ARTIFICIAL FEVER THERAPY IN ACUTE IRITIS

CASE 1.—*History.*—R. J., a man, aged 46, a salesman, for the past twelve years had had eight attacks of iritis in the left eye and one in the right. Some of these were very severe, causing great congestion and even hemorrhages. He stated that leeches had been employed. A careful search for foci of infection was made in past attacks. This attack in the left eye had been in progress one week.

Examination.—The iris was well dilated with atropine. Old points of adhesions were seen on the anterior surface of the lens. There were no hemorrhages. The fundus was normal. Tension to finger palpation was normal. The right eye was not involved. The vision with glasses was 20/50 right and 20/200 left. The general physical examination, including a blood Wassermann test, was negative. It was decided to try fever therapy.

Course.—Fever therapy May 7, 1934, gave a rectal temperature of from 105 to 107 F. for five hours. The eye was examined two days later and there were still some precipitates present, but there was less pericorneal injection and the iris was less swollen. May 14 a second fever treatment was given. The temperature range was from 104 to 106 F. for five hours. The eye was examined four days later and there was quite definite improvement. No further treatments were necessary. One month later the man appeared with an acute cold, and four months later with another, but each time there was no evidence of iritis.

CASE 2.—*History.*—P. M., a man, aged 34, a laborer, was referred to us May 2, 1932, for treatment of the right eye. He stated that sand was blown into it at the factory. There was pain, photophobia, and the feeling of a foreign body in the eye. The duration was ten days. An acute iritis was found. Physical examination revealed chronic tonsillitis, gingivitis and chronic prostatitis. There was a negative Wassermann reaction. While he was in the hospital, atropine and typhoid vaccine were used. The iritis cleared in ten days. The prostatitis was later treated in the outpatient department. Jan. 2, 1935, the patient was returned to us again with a similar complaint and condition of the right eye.

Examination.—The cornea was infiltrated and dull; there was deep pericorneal injection and tenderness. The iris was swollen and not dilated.

Course.—On this admission the iris was dilated with atropine, and fever therapy was given at once. The rectal temperature range was from 105.4 to 107.6 F. for five hours. The following day the iris was much less edematous, the cornea was much clearer, and the pain and tenderness had largely subsided. Two days later the inflammation had practically subsided and the patient was discharged from the hospital to return to work.

CASE 3.—*History.*—A. H., a girl, aged 14, in school, seen March 7, 1934, complained of pain and redness in the left eye. This had been present for some time and had been treated elsewhere. She had been a patient in 1933, when glasses were fitted. At that time there was no history of previous difficulty except that of blurred vision, which the glasses corrected.

Examination.—The pupil of the left eye was well dilated and there were no adhesions. Pericorneal injection was present and there were precipitates in the anterior chamber. Further examination revealed tonsil and adenoid tags as the only possible focus. A tuberculin test was not made at this time. The Wassermann reaction was negative.

Course.—The patient was given an ampule of calcium gluconate intravenously and atropine instillation. The eye looked better and there was no pain on the succeeding day. By March 16, nine days later, under calcium gluconate therapy, there had been slow improvement, but precipitates still persisted. Artificial fever therapy was then instituted. March 17 a treatment was given with a temperature range of from 104.6 to 105.6 F. rectally for five hours. There was further evidence of improvement noted on March 19. A second treatment was given on March 22. The rectal temperature was raised to from 104.6 to 106 F. for five hours. By March 25 the iritis had cleared quite well except for a few remaining precipitates. At this time the left disk was found to be quite hyperemic and the vision reduced to 6/30. Visual fields were not altered. The right eye was normal. A neurologic consultation was negative. The patient had no reaction to 0.1 mg. of old tuberculin intracutaneously. By June 4 the optic neuritis had improved and the vision was 6/75 without glass correction. The patient returned recently and there is no residual evidence of either optic neuritis or iritis. The vision in each eye is 6/75.

CASE 4.—*History.*—W. B., a man, aged 53, a laborer, complained of pain, inflammation and difficult vision in the right eye for about two months. He stated that no injury to the eye had occurred. There had been no previous attacks.

Examination.—There was marked ciliary injection; the iris was muddy looking and there was marked infiltration of the cornea. The tension was normal to finger palpation and the pupil was not dilated. The general examination revealed malnutrition, and possible arthritis of the knee and shoulder joints. There was no focus found in the tonsils, sinuses, teeth or prostate. The blood Wassermann reaction was negative.

Course.—April 9, 1934, fever therapy was given and a rectal temperature of from 105.2 to 106.4 F. for five hours was obtained. The next day the eye looked improved. Atropine 1 per cent was instilled. April 13 there was further improvement. The patient did not return until two weeks later, when the condition was worse again. Another fever treatment was given on April 27 and a rectal temperature range of from 105 to 107 F. was obtained. The patient never returned following this second treatment. A recall letter has failed to locate him.

CASE 5.—*History.*—J. D. D., a man, aged 47, an engineer, seen in December 1927, had an acute attack of iritis in the left eye. Examination showed an infection in the tonsils. These were removed, and along with atropine and salicylates the iritis cleared in three weeks. He returned in August 1930 with a recurrence. A search for a focus was negative. This time typhoid vaccine was used and the eye improved in one week. In October 1933 there was a third recurrence. This time calcium gluconate intravenously was used and the eye cleared in four days. The fourth attack came on Feb. 17, 1934, and the right eye became involved, February 20. Under atropine and calcium gluconate the eyes subsided rapidly. A fever treatment was subsequently given in an effort to see whether it might be of value in avoiding a recurrence. February 27 a rectal fever was obtained ranging from 105.4 to 106.4 F. A second treatment was proposed but not carried out. The comment from the patient, contained in a letter dated April 10, 1934, was to the effect that this treatment impressed him as the best of any form of treatment given him.

CASE 6.—*History.*—E. J. M., a man, aged 34, a laborer, seen May 26, 1934, stated that oil had been splashed in the right eye one week before. The eye was painful, and marked photophobia and lacrimation were complained of. There was a history of a gonorrheal infection eighteen years before. In 1926 he was admitted to the hospital with a diagnosis of chronic arthritis, tonsillitis and prostatitis. The prostatitis was treated and the patient disappeared.

Examination.—The right eye presented a marked injection with a steamy cornea and a tonometer reading of 90. It was felt that this was a secondary glaucoma superimposed on an acute iridocyclitis. The general examination disclosed chronic tonsillitis, a normal prostate and a negative Wassermann reaction. Dental roentgenograms were also negative.

Course.—The first fever treatment was given immediately. A rectal temperature of from 104 to 105.8 F. was maintained for four hours. There was definite improvement the following day. The second fever therapy three days later, May 29, gave a rectal temperature of from 105 to 106 F. for five hours. The next day there was still marked improvement. By June 9, fourteen days after the first treatment, practically all injection had gone and the tension was 20. By June 12 the fundus could be readily seen and gross objects noted. June 21 the vision was 6/30 without glasses. A tonsillectomy was done, June 27. No subsequent report is available.

SUMMARY

1. *Corneal Ulcers.*—Eight cases of corneal ulcer were treated and are reported in an attempt to evaluate their response to artificial fever therapy. The results

may have been influenced by the necessity of continuing other forms of therapy at the same time. Nonspecific protein therapy was purposely omitted.

Four of these cases presented a history of trauma; three were considered catarrhal and one Mooren's ulcer. A general physical examination was done on each patient in an attempt to check any etiologic or associated factors.

Patient 1 was treated twenty-five days without healing, and after one fever treatment was well in four days. Five weeks later a recurrence was twice treated by fever and promptly healed, without any local medication.

Case 2 seemed to heal more rapidly after the electric cautery was applied.

Case 3 was treated medically twenty-three days before fever therapy and healed in eight days after one treatment.

Case 4 seemed to make more progress after one fever treatment than before with medical therapy alone.

Case 5, with catarrhal ulcers, healed with fever therapy in eight days, after having had medical treatment alone for one month.

Case 6, probably a catarrhal ulcer, responded quickly after one fever treatment.

Case 7 seemed to improve after each fever treatment.

Case 8, Mooren's ulcer, after thirteen fever treatments made no response.

2. *Acute Iritis.*—Six cases of acute iritis were treated. A general physical examination was made in each case to determine any etiologic factors. Little help was obtained from these surveys. Atropine was used in all cases. No nonspecific proteins or salicylates were given. Calcium gluconate was used in two cases before fever therapy was instituted.

Cases 1 and 5 are of the chronic recurring type. Fever therapy was given to determine its effect on recurrences. Time is required to decide the final result.

Patient 2 returned after two and one-half years with a second attack. This subsided promptly after one fever treatment.

Case 3 improved as to the iritis, but an optic neuritis did not respond until after tonsil and adenoid tags were removed.

Patient 4 was inadequately treated, owing to lack of cooperation.

Case 6 was most striking. A severe iridocyclitis, with secondary glaucoma, responded quickly and favorably to fever therapy.

CONCLUSION

Prompt healing of some corneal ulcers after fever therapy is a striking fact. Local treatment is quite adequate in many cases, but fever treatment has hastened healing when local measures have seemed to be making little progress. This is particularly true in cases in which systemic stimulation is indicated.

The production of artificial fever in acute iritis is of definite value. Recovery is hastened. Further observation is necessary to determine the effect it has in preventing recurrences.

How to Become Fat or Thin.—Eating about 500 calories a day more than you spend will result in a gain of about a pound a week. Eating about 500 calories a day less than you spend will reduce your weight about a pound a week.—Sherman, H. C.: Food and Health, New York, Macmillan Company, 1934.

TREATMENT OF GONORRHEA IN THE FEMALE

BY MEANS OF SYSTEMIC AND ADDITIONAL PELVIC HEATING

WILLIAM BIERMAN, M.D.
AND
EDWARD A. HOROWITZ, M.D.
NEW YORK

We have found that the combination of systemic temperature elevation with simultaneous additional pelvic heating constitutes a method of treatment rapidly effectual in gonorrhea in the female. Our work is based on the fact that the gonococcus can be killed by temperatures that are not injurious to body tissues. The important considerations are the temperatures produced in the tissues in which the organism exists and the duration of the temperature elevation.

We have treated twenty-three female patients with gonorrhea whose subsequent course we have been able to follow closely. Ten of these patients previously had local chemical treatment, which had failed to cause the disappearance of gonococci. Eighteen of our twenty-three cases were complicated by salpingitis, six in the subacute and twelve in the chronic stage. In all these eighteen salpingitis cases, gonococci were found in smears of the secretions obtained from the cervix. In nine, gonococci were also obtained from the urethra. Of the five other patients, two suffered from gonorrheal arthritis (gonococci were found in the cervical and urethral secretions of both); one patient had an acute cervicitis only; one an acute urethritis with an accompanying bartholinitis; another suffered from a combination of gonorrheal cervicitis, urethritis and proctitis.

These patients received an average of a little less than three treatments each. This caused the complete disappearance of gonococci in nineteen of the twenty-three cases. In two of the remaining four cases the gonococci disappeared from the cervix (after two treatments each) but persisted in the urethra, from which they disappeared after the coagulation of Skene's ducts. One patient with cervicitis, to whom a single treatment was administered, received a few subsequent applications of silver nitrate, which were sufficient to cause the disappearance of some persisting organisms. In one case, complicated by the presence of a severe gonorrheal proctitis, the organisms disappeared from the cervix and urethra but persisted in the rectum. In the two months subsequent to the treatment, nine smears revealed no gonococci in the secretion from the urethra and the cervix. However, the continued discharge from the rectum of pus containing numerous gonococci indicated the persistence of the proctitis. Immediately after a menstrual period two months subsequent to the treatments, the patient observed a return of the vaginal discharge. On examination, a purulent secretion was seen issuing from the urethra. It contained numerous pus cells loaded with gonococci. This appeared to be a reinfection of the urethra from the rectal discharge. The cervix remained clean. This case well illustrates the value of combined local and systemic temperature elevation. Evidently the organisms existed at a point in the alimentary tract beyond the region of high local temperature produced by the technic we employ.

From the Departments of Physical Therapy and Gynecology, Beth Israel Hospital.

In all our other cases, frequently repeated examinations have failed to reveal the recurrence of gonococci.

With the disappearance of the gonococci, the abnormal discharges usually cease. From the urethra no discharge can be expressed, or only a very scant milky discharge, which microscopically contains many epithelial cells, a few leukocytes and Döderlein bacilli. The cervical secretion becomes clear, mucoid, and in most instances scant. In a few multiparous patients with lacerated eroded cervices a moderate discharge persisted. Cervical smears continued to contain a moderate number of leukocytes, not clumped, mucus, and sometimes a number of bacteria, especially gram-negative bacilli and gram-positive cocci. These gram-negative bacilli were often seen in large numbers immediately after the disappearance of the gonococci. In some cases the abnormal secretions disappeared while gonococci were still present. In several cases enlargement of a Bartholin gland disappeared after the treatment, and secretion could no longer be expressed from its duct.

During the first treatment in cases presenting salpingitis or arthritis there is usually a cessation of pain, which may or may not subsequently recur. In most cases, pain is absent after the second treatment. In five salpingitis cases there was a later recurrence of pain without fever, although no gonococci could be found. The pain disappeared in two of these cases after a week of rest in bed. In two other cases the pain was relieved by ordinary pelvic diathermy treatments. In one case our combined treatment was repeated five weeks later with relief of pain.

Pelvic examination within a few days after treatment usually reveals a marked diminution of pelvic tenderness but little change in the size of the adnexal masses. From seven to ten days after treatment there is usually an increased mobility of the uterus and some shrinkage of the inflammatory masses. About two weeks after treatment the adnexal masses become very much smaller. Five of our eighteen cases of salpingitis still presented some enlargement of the adnexa when examined several months after treatment. Two of these had been in the subacute stage when treated and the other three in the chronic stage. These masses were very much smaller than they had been originally. In only one of these five cases was the residual mass as large as a tangerine orange. This patient had had repeated attacks for eight years. She entered the hospital with a mass in the right lower part of the abdomen extending to an inch above the anterosuperior iliac spine. There was a smaller mass on the left side. She received a total of eight treatments, following which the adnexal masses subsided but did not disappear. Her only complaint now is polymenorrhea, which has persisted since a year before the treatment.

A fairly typical case history is that of F. L., aged 23, who was admitted to the gynecologic service at the Beth Israel Hospital, Nov. 9, 1933, complaining of abdominal pain and irregular vaginal bleeding. The menstrual periods occurred at intervals of from one to three months and were of five days' duration, with a normal flow and no pain. She had had two induced abortions. For the past six months there had been a greenish vaginal discharge. Two weeks before admission, at the time menstruation was expected, she began to have vaginal spotting, followed by pain in the lower part of the abdomen. Six days before admission the pain became more severe and clots were passed from the vagina. The temperature on admission was 100.6 F. Thereafter there was a daily elevation a little over 100 F., until the first treatment was administered on her sixth day at the hospital, after which her temperature was normal. Examination on admission revealed tenderness in the lower part of the abdomen and marked tenderness on the right side of the pelvis. There was moderate vaginal bleeding. The leukocyte count was 14,000, with 74 per cent polymorphonuclears. Hemoglobin was 59 per cent and red blood cells numbered 3,300,000. The red blood cell sedimentation (Weiss modification of Fahraeus test) was 75 mm. in forty-five minutes (over 10 mm. is abnormal). Cervical and urethral smears contained intracellular gram-negative diplococci. Examination on November 10 elicited pain on moving the uterus. There was a tender mass on the right side, somewhat fixed; also a smaller mass on the left. The diagnosis of gonorrheal salpingitis was made. The vaginal bleeding ceased, but when the first fever treatment was administered, November 14, there was still considerable pain in the lower part of the abdomen. During the first treatment the pain disappeared and did not recur during the patient's stay in the hospital. However, gonococci were still recovered from the cervical secretion, so that a second treatment was administered two days later. Smears from urethra and cervix thereafter did not reveal any gonococci on repeated examination (November 18, 19, 20, 21, 22, 23, 27 and 29; December 1, 4 and 11; January 15 and 28; February 5, and March 5). The red blood cell sedimentation on November 15 was 56 mm.; on the 19th, 22 mm.; on the 20th, 16 mm. On January 15 it was within the normal range, 6 mm. Examination on November 18 elicited no pain. There was a definite thickening in the region of both adnexa and also in the culdesac of Douglas. There was moderate mobility of the uterus. The rectovaginal septum was indurated, especially toward the left. November 23 a discharge note described the uterus, anterior, as freely movable; the right adnexa were not palpable; the left were somewhat enlarged and tender; there was a thickening in the region of both sacro-uterine ligaments. When seen in the follow-up clinic, December 4, the patient felt perfectly well. The adnexa were palpable and slightly tender. Jan. 15, 1934, she was feeling well. She had just had a normal painless menstruation. No discharge was present. The adnexa were slightly thickened, the right twice the normal size and somewhat fixed. February 5 there was no pain or discharge; the left adnexa were a little larger than normal, fixed and not tender. March 5 the patient felt very well, but the left adnexa were still a little enlarged.

We have observed in other subacute salpingitis cases, as in the one just described, that the subsidence of the inflammatory process after treatment is paralleled by a return toward normal of the rate of red blood cell sedimentation. This was noted by us previously in cases of pelvic inflammation treated by radiothermy.[1]

In cases complicated by salpingitis, our best results have been obtained in the subacute and chronic stages. We prefer to wait for a period of about two weeks after the onset of an acute tubal infection.

The technic we now employ consists in the use of pelvic diathermy while the patient lies within a hood containing carbon filament lamps. By means of diathermy alone it is possible to maintain a temperature

1. Bierman, William, and Horowitz, E. A.: General Hyperthermia with Heat Localization by Radiothermy in the Treatment of Pelvic Inflammatory Disease, New York State J. Med. **33**: 218-223 (Feb. 15) 1933.

in the vagina of 108 F., which is 8.5 degrees above the normal. The temperatures in the bladder and rectum are usually elevated to within 1.5 degrees of the vaginal temperature.[2] The temperature of the tissue of the cervix, as indicated by a thermocouple needle inserted into it, becomes elevated to within about 1.5 degrees F. of the temperature registered by the vaginal electrode thermometer. The additional use of a cabinet surrounding the body, containing photothermal lamps, causes a rapid elevation of general body temperature, because of the prevention of heat loss from the body and the introduction of further heat energy into it.[3] This combined use of heat by diathermy and photothermy is usually sufficient to cause an elevation of the systemic temperature (as indicated by the temperature of the mouth) to from 105 to 106 F., within the period of about one and one-half hours. The vaginal temperature, as indicated by a thermometer in the vaginal electrode, is then easily raised to 111 or 112 F. These temperatures are maintained for a period varying from three to four hours.

The sensations of the patient undergoing treatment are those usually experienced during hyperpyrexia induced by high frequency currents. There is sometimes a sensation of pelvic warmth, but the patient is usually conscious only of a diffuse heating of the entire body. During the period of transition from normal temperature to 104 F. there is usually restlessness and general discomfort for which morphine or one of the barbiturates may be given. There is no pain at any time.

We have accepted for treatment only patients in good general condition, without cardiovascular or pulmonary disease or marked obesity. Treatments are not administered four days before the expected time of menstruation, during the period, or for three days afterward. Pregnant patients with gonorrhea have not been treated.

The only ill effects experienced by our patients have been the weakness and malaise complained of by some patients for a few days after treatment, herpes labialis, and in a few cases areas of coagulation of the vaginal mucosa. No serious ill effects were experienced in any case, nor was there aggravation of the pelvic inflammatory condition in any of our cases of salpingitis.

The idea of combined systemic and still higher local temperature elevation occurred to us five years ago.[4] We described a technic for accomplishing this by means of short waves[5] and reported the clinical results obtained by the use of this technic.[1] As we used the short wave radiation only for the purpose of temperature elevation and not for its maintenance, the differentially increased pelvic heating disappeared during the period in which the systemic temperature elevation was maintained only by means of the cabinet containing photothermal lamps. We subsequently attempted to maintain an increased temperature within the pelvis by means of diathermy applied to the hyperthermic patient after she had been transferred from the short wave machine (radiotherm), applying diathermy by means of a vaginal electrode and a suprapubic one. With this technic, the current that it was necessary to employ sometimes caused painful induration in the fatty tissues of the suprapubic region. We therefore abandoned this technic, until we determined to increase the area of our dispersive electrode. The employment of two large plates, one on the abdomen and the other under the back, as dispersive electrodes, was not always sufficient to prevent injury to the subcutaneous fat, even though we used a flannel pad soaked in a 10 per cent salt solution under the plates. We found it desirable to add two other plates about 3 inches wide and 5 inches long, applied to the outer aspect of each thigh.[6] These four dispersive plates were connected together to one terminal of the diathermy machine while the vaginal electrode was connected to the other terminal. With these large areas of application of the surface electrodes, overheating of the subcutaneous fat does not occur.

We ordinarily employ from 1,800 to 3,000 milliamperes of current as indicated by the hot wire meter. The current strength is varied to produce desired changes in the vaginal temperature. We found that a vaginal temperature between 111 and 112 F. (as indicated by the thermometer in the vaginal electrode) may ordinarily be maintained for a period of three and a half hours without causing tissue damage. A special vaginal electrode with rounded blunt edges minimizes the danger of mucosal burns.

The heat tolerance of human tissue has been determined by several workers. Kolmer and Liebesny[7] found that the diathermic coagulation of the scrotum of dogs did not occur below 113 F. Kyaw[8] demonstrated by the application of diathermy that 112 F. was the highest temperature that was tolerated by the human urethra without necrosis. Lavake[9] found that 113 F. developed in the cervix by means of diathermy was the highest temperature that did not cause a slough. Roblee and Royston[10] state that the threshold of living cell tolerance to heat is slightly over 112 F.

We observed that coagulation of the vaginal mucous membrane was produced in some cases by temperatures over 113 F. or sometimes by 112 F., maintained for a period longer than three and one-half hours. In these cases healing occurred within from four to six weeks, leaving areas that appeared normal.

To permit a prolongation of pelvic heating and to reach tissues beyond the posterior fornix, we insert a large electrode into the rectum and maintain it there for a period of from one and one-half to one and three-fourths hours prior to the insertion of the vaginal electrode. If the rectal diathermy is maintained for a period longer than one and three-fourths hours, some patients will develop pain in the rectum which may persist for several days.

A method that may be used to prolong the period of pelvic heating and yet avoid damage to the vaginal mucous membrane is to circulate cool water through the vaginal electrode. The temperature of the electrode may be lowered a few degrees without appreciably lowering the temperatures produced in the cervix and other pelvic tissues.

Our present technic is a satisfactory one but, undoubtedly, further improvements will be made in

2. Horowitz, E. A.; Derow, D., and Bierman, William: Temperature Determinations in the Female Pelvis During Diathermy, Am. J. M. Sc. **189:** 555-566 (April) 1935.
3. Bierman, William: The Effect of Photothermal Radiations upon Cutaneous and Subcutaneous Temperature, Arch. Phys. Therapy **14:** 717-721 (Dec.) 1933.
4. Letter from Dr. Bierman to Dr. W. R. Whitney, April 12, 1930.
5. Bierman, William, and Schwartzschild, Myron: General Hyperthermia with Heat Localization by Radiothermy, Proc. Soc. Exper. Biol. & Med. **29:** 439-441 (Jan.) 1932.
6. Duncan, I. G.: Treatment of Gonorrhea in Women, with Special Reference to the Use of Diathermy in Tubular Infections, Memphis M. J. **8:** 150-153 (Oct.) 1931.
7. Kolmer, W., and Liebesny, P.: Experimentelle Untersuchungen über Diathermie, Wien. klin. Wchnschr. **33:** 945-946 (Oct. 21) 1920.
8. Kyaw: Thermopenetration bei Gonorrhoe, Deutsche med. Wchnschr. **47:** 962-963 (Aug. 18) 1921.
9. Lavake, R. T.: Diathermy with Metal Electrode as a Possible Adjuvant in the Treatment of Gonorrhea in Women, Surg., Gynec. & Obst. **41:** 31-35 (July) 1925.
10. Roblee, M. A., and Royston, G. D.: The Treatment of Pelvic Inflammation by Medical and Surgical Heat, Am. J. Obst. & Gynec. **24:** 381-389 (Sept.) 1932.

the course of time. Illustrative of the improvements in our technic is the fact that our first eleven cases in this series required an average of 3.3 treatments, while an average of 2.2 treatments sufficed to accomplish our objective, the disappearance of the gonococci, in the last eleven cases. Four cases required only one treatment. The average of the number of treatments required was considerably raised by the one case described with the huge pelvic mass extending to well above the anterior superior spine of the ilium.

The degree of systemic temperature elevation may be varied by modifying the intensity of the photothermal energy and of the diathermy current applied to the body. It is dangerous to permit the systemic temperature to go above 107 F. We determined the systemic temperature by means of a clinical thermometer inserted under the tongue. In heating of the entire body, we have found that the mouth temperature averages 0.7 F. lower than the rectal temperature. At times the mouth temperature may be higher and at times more than 2 degrees lower than the rectal temperature.[11] In addition to the frequent systemic and local temperature observations, it is necessary to note constantly the general condition of the patient (color, character and frequency of the pulse rate and respiratory rate and the like).

There are various strains of gonococci. This may account for the different reports of the thermal death period of these organisms. Thus Corbus and O'Conor [12] stated that it was possible to destroy gonococci instantly at 45 C. (113 F.), while Schofield [13] found that at this temperature thirty minutes was necessary. Boerner and Santos [14] stated that the time required was thirty-seven minutes, and Van Putte [15] that it was more than six hours. Carpenter and Boak [16] showed that there were great differences in the thermal death times of different cultures of gonococci. From their in vitro studies of the organisms isolated from a given individual they could definitely predict the temperature and time required to kill these organisms in vivo. At the upper limit of systemic temperature elevation to which the human subject could be exposed with reasonable safety (41.5 C.) the time required to kill all the organisms varied with different strains of gonococci from six to twenty-six hours.[17] To maintain a systemic temperature of 41.5 C. for more than six hours is trying for the patient and difficult for the doctor. The bacteriologic complexities of the investigation of the thermal death times of organisms isolated from each clinical case, particularly in view of the fact that one patient may harbor several different strains, makes it impracticable to use this procedure for ordinary purposes.

The time required to kill the gonococcus diminishes greatly at higher temperatures. Boerner and Santos [14] found that at 44 C. gonococci were destroyed in half the time required at 42 C. and in less than one-third the time required at 41 C. As the organisms are localized in a definite part of the body in pelvic infections, the logical therapeutic procedure would create a temperature elevation within the safe upper limits of tissue tolerance in the region harboring the organisms. We have found this upper limit to be 44.5 C. (112 F.) and believe that the combination of systemic temperature elevation with coincidentally higher local pelvic temperatures accomplishes this with maximal effectiveness.

Any method that produces a definite rise in pelvic temperatures is of value in the treatment of gonorrhea. The best procedure for pelvic heating, heretofore, has been diathermy. While diathermy does produce substantial temperature elevations in the pelvis, the upper limit of maintained temperature is usually not beyond 108 F., and the temperature gradient from this region to other parts of the body is so sharp that the average elevation of mouth temperature is no more than 0.7 F.[2] It is possible by means of diathermy to produce a vaginal temperature elevation to 110 F. or higher, but this temperature level cannot be sustained for long periods by diathermy alone.

In our experience the temperature elevations produced by the Elliott method do not equal those produced by diathermy, yet good results have been obtained with the Elliott treatment by Holden and Gurnee [18] and by others. The Elliott treatment uses a soft rubber vaginal applicator distended by the circulation within it of hot water, at a temperature of from 120 to 130 F.

With all thermal procedures it is possible that the effects other than the direct bactericidal one may be responsible for a definite improvement. These effects include the induction of an active hyperemia with the increase of blood and lymph flow, the increase in the number of leukocytes and the acceleration of their phagocytic activity.[11] These factors, as well as the attenuating influence on the gonococci of a temperature elevation insufficient to exert a direct lethal effect, may also account for the fact that such organisms as remain succumb more readily to the action of the ordinarily employed germicidal solutions.

The local measures that have been applied for the heat treatment of female gonorrhea include not only the Elliott hot water bag and pelvic diathermy, which have been mentioned, but also the use of hot vaginal douches or irrigations and the application of various heated instruments. Guttman [19] treated the urethra and the cervix by means of sounds electrically heated to 130 F. Diathermy was applied within the urethra and the cervix by Cumberbatch and Robinson,[20] who used metal rods as active electrodes. A temperature of 114 F. was developed within tissues in contact with the active electrodes and maintained for ten minutes. Treatments were repeated twice a week. Corbus and O'Conor [12] used a similar technic except that the treatments were of thirty minutes' duration and were administered once in from seven to ten days. Duncan,[6] using a small Chapman vaginal electrode equipped with a thermometer, applied vaginal temperatures up to 110 F. for from thirty to forty-five minutes each day. This requires a powerful diathermy machine using a

11. Bierman, William, and Fishberg, Ella H.: Some Physiologic Changes Occurring During Hyperpyrexia Induced by Physical Means, J. A. M. A. **103**: 1354-1357 (Nov. 3) 1934.
12. Corbus, B. C., and O'Conor, V. J.: Diathermy in the Treatment of Genito-Urinary Diseases, St. Paul, Bruce Publishing Company, 1925.
13. Schofield, F. S.: The Effects of Temperature on the Viability of the Gonococcus, J. Urol. **17**: 581-591 (June) 1927.
14. Boerner, R., and Santos, C.: Ueber eine neue Art von Elektroden zur Behandlung der Gonorrhoe mittels diathermie, Med. Klin. **10**: 1062 (June) 1914.
15. Van Putte, P. J., cited by Van Leeuwen, T. M.: The Treatment of Gonorrhea by Diathermy, Internat. Clin. **1**: 38-42 (March) 1927.
16. Carpenter, C. M.; Boak, R. A.; Mussi, L. A., and Warren, S. L.: The Thermal Death Time of Neisseria Gonorrheae in Vitro, J. Lab. & Clin. Med. **18**: 981-990 (July) 1933.
17. Warren, S. L.; Boak, R. A., and Carpenter, C. M.: A Correlation Between the In Vitro Thermal Death Time of the Gonococcus and the Febrile Period Required at 41.5° C. for Cure, Read at the Fourth Annual Fever Conference, April 27, 1934.
18. Holden, F. C., and Gurnee, W. S.: The Elliott Treatment, Am. J. Obst. & Gynec. **22**: 87-96 (July) 1931.
19. Guttman, Eugene: Ueber die Heizsondenbehandlung der weiblichen Gonorrhoe, Monatschr. f. Geburtsh. u. Gynäk. **48**: 428-443 (Dec.) 1918.
20. Cumberbatch, E. P., and Robinson, C. A.: Treatment of Gonococcal Infection by Diathermy, Brit. M. J. **2**: 54-56 (July 14) 1923.

continuously increasing current strength (up to 3,500 milliamperes). Two European workers have reported cures of female gonorrhea following a single prolonged vaginal diathermy treatment. Kyaw [21] applied vaginal diathermy at least three or four hours continuously, sometimes giving a total of nine hours of treatment in a single day. Temperatures between 106 and 109.4 F. were maintained in the vagina. Van Putte [22] administered vaginal diathermy treatments of five hours' duration, developing a temperature of 104 F. in the vagina.

Chronic gonorrhea in the female has been treated by means of systemic fever produced in various ways. Patients have been inoculated with the plasmodium of malaria or injected with one of a number of pyrogenic substances. In addition, therapeutic fever has been produced by physical measures, such as hot baths, radiant heat and high frequency currents. With malaria, a series of from nine to twelve fever bouts has usually been employed. The malaria treatment has been reported by different workers to cure between 66 and 83 per cent of female patients with chronic gonorrhea.[23]

In those cases in which gonococci were still present at the end of malaria treatment, a short period of local (chemical) treatment usually resulted in cure.[24] Most of these cases had previously failed to respond to local treatment. Warren and Wilson,[25] who induced therapeutic fever by means of high frequency currents, cured three of six cases of chronic female gonorrhea by a single fever treatment of five hours at 106.5 F. The three cases in which gonococci persisted became negative after a few local treatments.

SUMMARY

A method for intense prolonged heating of the female pelvic organs has been found rapidly effectual in the treatment of gonorrheal infections. A systemic temperature elevation of from 105 to 106 F. is produced by means of pelvic diathermy and photothermy during a period of from one and one-half to one and three-fourths hours. With the use of a special vaginal electrode equipped with a thermometer, the vaginal temperature is maintained between 111 and 112 F. for three and one-half hours. A special arrangement of four dispersive electrodes is necessary. The treatment is painless but there is discomfort from the systemic fever. Constant watchfulness throughout treatment is imperative. An average of less than three treatments caused the complete disappearance of gonococci in nineteen of twenty-three patients treated. In two of the remaining cases the cervix was freed from gonococci after two treatments but not the urethra. In these two cases, coagulation of Skene's ducts cleared up the urethra. A case of cervicitis treated once was not freed from gonococci. In one case a reinfection of the urethra occurred from a persistent gonorrheal proctitis. Patients with salpingitis or arthritis were relieved from pain after one or two treatments. Abnormal discharges rapidly disappeared. Inflammatory masses subsided, but some adnexal enlargement persisted in five of eighteen cases of salpingitis. The treatment is strenuous and patients with cardiovascular or pulmonary disease should not be subjected to it. No serious ill effects were experienced by any of our patients.

471 Park Avenue.

21. Kyaw (footnote 8); Thermopenetration bei weiblicher Gonorrhoe, Deutsche med. Wchnschr. **48:** 902-903 (July 7) 1922.

22. Van Putte, P. J.: Diathermy in the Treatment of Gonorrhea in Women, Am. J. Phys. Therapy **8:** 164-166 (Sept.) 1931.

23. Lenzman, R.: Ueber Behandlung der chronischen Gonorrhoe durch Malariaübertragung, Deutsche med. Wchnschr. **52:** 1608-1610 (Sept. 17) 1926. Weigand, Hans: Malariabehandlung der weiblichen Gonorrhoe, Zentralb. f. Gynäk. **53:** 2834-2838 (Nov. 9) 1929. Kruspe, M.: Unsere Erfahrungen mit Malaria und Saprovitan, Arch. f. Dermat. u. Syph. **157:** 125-140, 1929. Nast, O., and Riebe, W.: Ueber die Behandlung der weiblichen Gonorrhoe durch Impfmalaria, Dermat. Ztschr. **60:** 427-437 (April) 1931. Hanow, B.: Erfahrungen über die Malaria- und Pyriferbehandlung bei Lues und Gonorrhoe, ibid. **63:** 173-188 (Feb.) 1932.

24. Nast and Riebe.[22] Hanow.[23]

25. Warren, S. L., and Wilson, K. M.: The Treatment of Gonococcal Infections by Artificial (General) Hyperthermia, Am. J. Obst. & Gynec. **24:** 592-598 (Oct.) 1932.

THE DIAGNOSIS OF TRICHINOSIS

WITH ESPECIAL REFERENCE TO SKIN AND PRECIPITIN TESTS

WESLEY W. SPINK, M.D.
AND
DONALD L. AUGUSTINE, Sc.D.
BOSTON

Regardless of the fact that trichinosis has been studied for more than eighty years as a human disease, it still remains often difficult to diagnose clinically. Observers who have had the opportunity to study cases occurring in epidemics have noted the varying clinical course of the disease, and clinicians unanimously agree that it is the sporadic case and the milder forms of the disease which are particularly confusing and which often pass unrecognized by the attending physician.[1] From recent statistical studies, it now appears that trichinosis is a common disease in this country and, further, the majority of cases seem to be of the milder forms. As a specific example, Queen,[2] by artificial digestion of diaphragms from 344 consecutive necropsies in Rochester, N. Y., found fifty-nine (17.5 per cent) parasitized with Trichinella spiralis. None of these cases had a history of trichinosis, although some gave a vague "rheumatic" history. In a second series of fifty-eight cases in Boston, sixteen (27.6 per cent) were found positive by Queen, using the same method

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School; and the Department of Comparative Pathology, George Fabyan Foundation, Medical School and School of Public Health, Harvard University.

1. Reports include the following:
Albert, H.: An Epidemic (Fourteen Cases) of Trichinosis, Due to Eating Boiled Ham, with Special Reference to the Occurrence of Eosinophilia, Am. J. M. Sc. **140:** 167 (Aug.) 1910.
Alexander, M. E.: Trichiniasis, Endemic and Sporadic, with a Review of the Present Status of the Treatment of the Disease, ibid. **165:** 567 (April) 1923.
Aldridge, F. C.: An Outbreak of Trichinosis in Pennsylvania, ibid. **181:** 312 (March) 1931.
Willett, J. C., and Pfan, C. L.: Trichinosis: An Outbreak Involving Twenty Cases and One Death, J. A. M. A. **94:** 1060 (April 5) 1930.
Salzer, B. F.: A Study of an Epidemic of Fourteen Cases of Trichinosis with Cures by Serum Therapy, ibid. **67:** 579 (Aug. 19) 1916.
McDonald, E. P., and Waddell, K. C.: Epidemic of Trichinosis, ibid. **92:** 449 (Feb. 9) 1929.
Thompson, W. G.: Trichinosis: A Clinical Study of Fifty-Two Sporadic Cases, Am. J. M. Sc. **140:** 157 (Aug.) 1910.
Cummings, W. T., and Carson, G. R.: Trichinosis: A Study of Fifteen Cases, J. A. M. A. **67:** 806 (Sept. 9) 1916.
Kratz, F.: Vorläufiger Bericht über die Trichinen-Epidemie in Hedersleben, Berlin. klin. Wchnschr. **2:** 509 (Dec.) 1865; Die Trichinen-Epidemie zu Hedersleben: Beitrag zur Pathologie und Therapie der Trichinen-Krankheit, Leipzig, W. Englemann, 1866.
Zörkendörfer, C.: Ueber die Aetiologie einer Massenerkrankung in Teplitz-Schönau nach dem Genusse von Fleisch- und Wurstwaaren (Trichinose und Miltzbrand), Ztschr. f. Heilk. **15:** 435, 1894.
Garland, J.: A Clinical Study of Trichinosis with Case Reports, Boston M. & S. J. **188:** 773 (May 17) 1923.
Mancusi-Ungaro, L.: Mild Forms of Trichinosis, J. M. Soc. New Jersey **26:** 671 (Oct.) 1929.
Conner, L. A.: Atypical Clinical Forms of Trichinosis, Ann. Int. Med. **3:** 353 (Oct.) 1929.
Herzberg, E., and Vitenson, I.: Unsuspected Trichinosis, Brit. M. J. **1:** 650 (April 5) 1930.

2. Queen, F. B.: The Prevalence of Human Infection with Trichinella Spiralis, J. Parasitol. **18:** 128 (Dec.) 1931.

of diagnosis. More recently Riley and Scheifley [3] reported their results of examining cadavers for trichinosis at the anatomy laboratory of the University of Minnesota Medical School. In one series of 116 cadavers, twenty (17.9 per cent) were positive, while in a second series of fifty cadavers ten (20 per cent) were positive.

During the past three years we have observed thirty-five cases of sporadic trichinosis at the Boston City Hospital and in the environs of Boston. The correct diagnosis of trichinosis was made in eleven of these cases when first seen. In the remaining twenty-four cases, other diagnoses were made, and trichinosis was not suspected until additional histories were obtained, further laboratory data made available, skin and precipitin tests performed, and the clinical courses of the cases closely observed. We will present a brief analysis of certain clinical aspects of these cases and also an evaluation of the methods used today in diagnosing this disease, with particular reference to the value of skin and precipitin tests.

LIFE CYCLE OF TRICHINELLA SPIRALIS

The signs and symptoms that may occur in trichinosis are best understood if a brief descriptive review is given of the life cycle of the parasite. Infected meat ingested by man is first digested in the stomach with the freeing of the larvae from their cysts. They pass into the small intestine within the first twenty-four hours, where they mature, and copulation takes place. The female burrows beneath the surface of the mucosa, and as early as the fourth day larvae are deposited in the lymph spaces. Thence the young parasites pass into the blood stream, to be carried to all parts of the body. These young worms then penetrate the skeletal muscles, where further development takes place, and they become encysted. Larvae may enter the circulation from the intestine for several weeks, the number rapidly declining after the first two weeks. The varied clinical course of the disease is understood when it is realized that trichinosis is a blood stream infection and that larvae may lodge in other tissues than skeletal muscle. It is only in the skeletal muscle that they develop fully. The larvae were first found in the blood of a human being in 1909 by Herrick and Janeway.[4] Larvae, first demonstrated in the spinal fluid by Van Cott and Lintz,[5] have been found by several other workers.[6] Frothingham [7] demonstrated, at autopsy, the larvae in a mesenteric lymph node, the lungs, heart, liver sinusoids, brain and pancreas. Subsequently, others found the larvae in the brain at autopsy.[8] Graham [9] found embryos in a section of rat's artery. Prym [10] observed the living parasite in pericardial fluid, in esophageal and pharyngeal muscles, and in the bone marrow. Larvae have been recovered from the gall-bladder,[11] pleural exudate, milk of a nursing woman, mammary gland, placenta, pus from the external auditory canal (Salzer [1]), and from the pus of a furuncle.[12] One of us (D. L. A.) has repeatedly recovered living embryos from the peritoneal fluid of infected mice, although they were not found in placentas.[13] Finally, they have been detected in the muscles belonging to the bones of the middle ear, in those of the soft palate, in the external sphincter ani, and in the muscles of the urethra.[14]

ANALYSIS OF THIRTY-FIVE CASES

Preliminary Diagnoses.—Following are the preliminary diagnoses made after a history had been taken and a complete physical examination done, with laboratory data incomplete: trichinosis (eleven), acute nephritis (six), "upper respiratory infection" (six), typhoid (three), pelvic inflammatory disease (three) poliomyelitis (two), gastro-enteritis (two), tuberculous meningitis (two), colitis, angioneurotic edema, erysipelas, undulant fever, tetanus, occupational conjunctivitis, influenza, peripheral neuritis, lead poisoning, scarlet fever, arthritis, hypotension, rheumatic endocarditis, syphilis and tuberculosis. The correct diagnosis of the twenty-four incorrectly diagnosed cases depended on further laboratory data, additional history, or observation of the clinical course.

Gastro-Intestinal Symptoms.—Gastro-intestinal symptoms are prominent in the disease picture, but in eleven of the thirty-five cases, or 31.4 per cent, they were entirely absent. Table 1 shows the symptoms that were present in twenty-four of the cases. Aldridge [1] reported an epidemic of twenty-nine cases, and, in twenty, gastro-intestinal symptoms were absent.

In a few cases the time interval was known between the ingestion of the infected pork products and the onset of gastro-intestinal symptoms. In four cases the onset was within twenty-four hours and in three cases within forty-eight hours. Diarrhea lasted eight weeks in one patient and seven weeks in a second. One patient had nausea and vomiting for four and one-half weeks. In a majority of the cases it was striking how acutely the gastro-intestinal symptoms began and how abruptly they ended.

One of us (D. L. A.) has observed the disease in a pig fed trichinella larvae. Seven months later the animal was fed larvae again, and a violent but short-lived diarrhea ensued of from one to two days' duration; then the animal appeared symptom free. It appears that the animal's gastro-intestinal tract was "sensitized" following the first infection and rapidly expelled the worms after the second infection. This is in accord with the experimental work of Ducas [15] and McCoy.[16]

3. Riley, W. A., and Scheifley, C. H.: Trichinosis of Man a Common Infection, J. A. M. A. **102**: 1217 (April 14) 1934.

4. Herrick, W. W., and Janeway, T. C.: Demonstration of Trichinella Spiralis in the Circulating Blood in Man, Arch. Int. Med. **3**: 263 (April) 1909.

5. Van Cott, J. M., and Lintz, William: Trichinosis, J. A. M. A. **62**: 680 (Feb. 28) 1914.

6. Reports have appeared by:
Bloch, Leon: Trichinosis, J. A. M. A. **65**: 2140 (Dec. 18) 1915.
Elliott, A. R.: Trichinosis: Report of a Case with Trichina Larvae in the Spinal Fluid, ibid. **66**: 504 (Feb. 12) 1916.
Cummings, N. T., and Carson, G. R.: A Case of Trichinosis with Embryo in the Spinal Fluid, ibid. **66**: 1856 (June 10) 1916.
Meyer, Jacob: Trichinosis: A Report of Three Cases Simulating Meningitis, with the Finding of Trichina Larvae in Spinal Fluid, ibid. **70**: 588 (March 2) 1918.

7. Frothingham, Channing: The Lesions Caused by Trichina Spiralis in Man, J. M. Research **15**: 483, 1906.

8. Observations have been reported by:
Hassin, G. B., and Diamond, I. B.: Trichinosis Encephalitis, Arch. Neurol. & Psychiat. **15**: 34 (Jan.) 1926.
Gruber, G. B., and Gamper, E.: Ueber Gehirnveränderungen bei menschlicher Trichinose, Verhandl. d. deutsch. path. Gesellsch. **22**: 219, 1927.
Pund, E. R., and Mosteller, Ralph: Trichinosis: Demonstration of the Parasites in the Brain, J. A. M. A. **102**: 1220 (April 14) 1934.

9. Graham, J. Y.: Beiträge zur Naturgeschichte der Trichina Spiralis, Arch. f. mikr. Anat. **50**: 219, 1897.

10. Prym, P.: Ueber Trichinose beim Menschen, Centralbl. f. allg. Pathol. u. path Anat. **34**: 89, 1923.

11. Horlich, S. S., and Bicknell, R. E.: Trichinosis with Widespread Infestation of Many Tissues, New England J. Med. **201**: 816 (Oct. 24) 1929.

12. Friedreich, N.: Beobachtungen über Trichinosis, Deutsches Arch. f. klin. Med. **9**: 459, 1872.

13. Augustine, D. L.: Studies on the Subject of Prenatal Trichinosis, Am. J. Hyg. **19**: 115 (Jan.) 1934.

14. Condie, D. F., in Watson's Practice of Physic, Philadelphia, Blanchard & Lea, 1853, p. 830.

15. Ducas, R.: L'immunité dans la trichinose, thesis, Paris, Jouve et Cie, 1921.

16. McCoy, D. R.: Immunity of Rats to Reinfection with Trichinella Spiralis, Am. J. Hyg. **14**: 484 (Sept.) 1931.

It is possible that some of the diarrhea and gastro-intestinal upsets seen in patients, which are not followed by other symptoms, occur in persons who have had a previous trichinous infection.

Muscle Pains and Aches.—There were twenty-six of the thirty-five patients who complained of muscle pains and aches during the course of their infections. It is significant that four patients had diarrhea but no muscle pain, and thirteen patients had muscle pains but no diarrhea. Of the thirteen patients without diarrhea, five had nausea and vomiting.

Eye Signs and Symptoms.—The eye signs and symptoms are of importance in the diagnosis of trichinosis. Weitz [17] explains the facial edema on a basis of toxicity

TABLE 1.—*Gastro-Intestinal Symptoms Present in Twenty-Four of the Thirty-Five Cases of Trichinosis*

Symptoms	Number of Cases
Diarrhea	12
Abdominal pain and cramps	7
Vomiting	7
Nausea	6
Constipation	3

and local obstruction. The edema of the eyelids and face may simulate sinusitis.[18] Carter [19] presents an excellent discussion of the ocular manifestations of trichinosis. Table 2 shows the signs and symptoms that we have observed. In our series there were nineteen patients with signs and symptoms referable to the eyes, while in sixteen they were absent.

Chills and Fever.—Much has been written concerning the temperature in trichinosis; it has been described in detail by Blumer.[20] The temperature curve is not unlike that of typhoid, declining by lysis. The accompanying chart illustrates the temperature, pulse and respiration in two patients with a moderately severe infection. Eight of our patients gave a history of chills.

Skin Manifestations.—The skin manifestations in trichinosis are relatively uncommon and seldom commented on. Two patients had a maculopapular eruption on the abdomen closely resembling "rose spots." Two others had an erythematous lesion not unlike that found in scarlet fever. There was one case each of erythema multiforme and furunculosis. In one patient small, elevated, erythematous lesions developed under the skin of both palms.

Respiratory Signs and Symptoms.—The respiratory signs and symptoms occurring in trichinosis have been described by Minot and Rackemann.[21] Nine of their cases (8.8 per cent) "showed respiratory signs or symptoms, or both, severe enough to lead to a serious consideration or actual diagnosis of a purely pulmonary condition during the first few days the patients were in the hospital." MacKenty [22] had cases presenting severe edema of the larynx, and intubation was necessary in one. In our series, two patients had a cough productive of bloody sputum; two had dyspnea, presumably due to the invasion of the diaphragm and intercostal muscles by larvae; two had a severe cough; one had râles at the right base, and two had pain on respiration.

Cardiovascular Complications.—The cardiovascular complications occurring in trichinosis are taken up in detail elsewhere.[23] Myocarditis is one of the most serious complications. It appears to be related to the invasion of the myocardium by larvae.[24] In our series of thirty-five cases there were two deaths with a complicating myocarditis, one proved at autopsy. The reaction in the cardiac muscle is not specific. It is an active, cellular infiltration, usually focal, but distributed throughout the myocardium with the production of necrotic and fragmented fibers. Death from myocarditis usually takes place between the fourth and eighth weeks. Dyspnea occurred in two patients because of myocardial failure. In seventeen cases, from one to five electrocardiograms were taken. Three patients showed evidence of myocardial changes with inversion of the T waves, especially in lead 2. These changes were not permanent. Another case showed a transient intraventricular block, and two others presented marked right ventricular preponderance.

In one patient a permanent right hemiplegia developed during the course of the disease. One had a complicating thrombophlebitis of the saphenous vein of the lower leg.

Cheney [25] has called attention to the occurrence of extreme hypotension in trichinosis. In twelve of our patients a hypotension developed with a systolic pressure of less than 100 mm. of mercury and a diastolic pressure as low as 38. The average diastolic pressure in these twelve cases was 50 mm. of mercury.

Neurologic Signs and Symptoms.—Since larvae are found in the spinal fluid and have been observed in the brain, it is not unusual to see cases presenting neurologic manifestations. Hassin and Diamond [8] describe a case of encephalitis in which the parasite was recovered from the brain at autopsy, and Meyer [6] reports cases simulating meningitis. In two of our patients there was absence of deep reflexes, absent muscle pains and signs of an acute infection, and the diagnosis of poliomyelitis was made. A third patient had a stiff neck, drowsiness became a symptom, and there were signs of an acute infection. Meningitis was the tentative diagnosis.

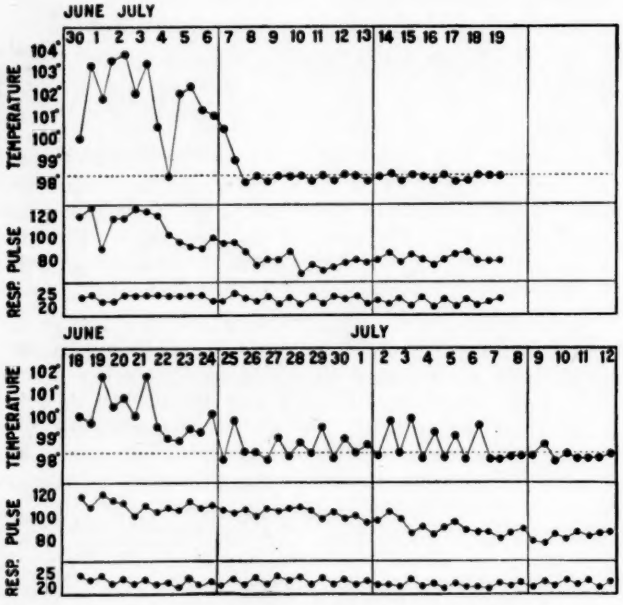
TABLE 2.—*Ocular Signs and Symptoms Observed in Nineteen of the Thirty-Five Cases*

Signs and Symptoms	Number of Cases
Puffiness of eyelids	17
Injection of conjunctivae	5
Pain on movement or pressure	3
Photophobia	3
Burning and itching	2
Hemorrhage into sclerae	1
Retinal hemorrhage	1

Sources of Infection.—The sources of infection were learned in fifteen cases, as follows: cooked pork sausage (six), pork chops (three), raw pork sausages (two), boiled ham (two), uncooked salt pork (one), and raw pork sandwiches (one).

17. Weitz, Wilhelm: Zur Klinik der Trichinose, Klin. Wchnschr. **10:** 938 (May 16) 1931.
18. Pratt, E. L.: Trichinosis Simulating Frontal Sinusitis: A Report of Three Cases, J. A. M. A. **65:** 1277 (Oct. 9) 1915. Thomas, J. B., and Cooper, W.: Trichinosis with Predominant Symptoms Referable to Eyes and Frontal Sinuses, Am. J. Ophth. **7:** 511 (July) 1924.
19. Carter, L. F.: Trichinosis and Its Ocular Manifestations, J. A. M. A. **95:** 1420 (Nov. 8) 1930.
20. Blumer, George: Trichiniasis, Nelson Loose-Leaf Living Medicine, New York, Thomas Nelson & Sons **2:** 453, 1920.
21. Minot, G. R., and Rackemann, F. M.: Respiratory Signs and Symptoms in Trichinosis, Am. J. M. Sc. **150:** 571 (Oct.) 1915.
22. MacKenty, J. E.: Trichinosis of the Upper Respiratory Passages, with Report of Cases, Manhattan Eye, Ear and Throat Hospital Report, **10:** 115 (Feb.) 1909.
23. Spink, W. W.: Cardiovascular Complications of Trichinosis, Arch. Int. Med., to be published.
24. Zoller, Heinz: Ueber die Herzmuskelentzündung im Verlauf der Trichinose, Virchows Arch. f. path. Anat. **265:** 430, 1927. Spink, W. W.: Clinical and Pathological Observations of the Heart in Trichinosis, J. Clin. Investigation **13:** 708 (July) 1934. Dunlap, G. L., and Weller, C. V.: Pathogenesis of Trichinous Myocarditis, Proc. Soc. Exper. Biol. & Med. **30:** 1261 (June) 1933.
25. Cheney, Garnett: Sporadic Trichinosis with Extreme Hypotension, J. A. M. A. **86:** 1004 (April 3) 1926.

White Blood Cell Count and Eosinophilia.—Much has been written concerning the white blood cell count and eosinophilia in trichinosis since Brown [26] first called attention to their diagnostic importance. The white blood cells in trichinosis are not greatly increased. In our cases they ranged usually between 7,000 and 17,000 cells per cubic millimeter; in one case they reached 34,000 per cubic millimeter. As is well recognized, the occurrence of an eosinophilia in the blood of a suspected case of trichinosis is the most helpful aid in diagnosis. Twenty-two of our cases, or 62.8 per cent, were first diagnosed trichinosis because of the presence of an eosinophilia. One patient had 89 per cent eosinophils. Every patient except three had an eosinophilia when the blood was first examined. A count of 4 per cent may be considered the upper normal limit. In the three patients who did not have an eosinophilia, secondary infections were present. One had an ulcer on the foot, the second had a complicating furunculosis, and the third had bronchopneumonia. Elsewhere,[27] attention has been called to the effect of



The daily temperature, pulse and respiration in two cases of trichinosis.

secondary infections on the eosinophilic level in trichinosis. In two of the foregoing cases the secondary infection subsided, and simultaneously there was a rise of eosinophils in the blood. The third patient died of pneumonia. Eosinophilia in trichinosis usually begins in the second week, and sometimes not until the third week of the infection, reaches its height in the third to fourth weeks, and then gradually declines. It may persist for several weeks and, in slight degrees, for months. It is commonly held that the eosinophilia is absent during the early stages of the disease and declines rapidly in fatal cases a few days before death. One of us (W. W. S.) has observed in animal experiments that the eosinophilia does not occur until the muscles are invaded by the parasite.

Skin and Precipitin Tests.—Serologic and skin tests have been employed only recently in the diagnosis of trichinosis and have been found of great value in doubtful cases. Bachman [28] demonstrated with laboratory animals that precipitins can be detected about the thirtieth day after infection, whereas a delayed type of skin reaction was produced within a week after infection. Stoll,[29] Hunter,[30] and Swineford and Waddell [31] have reported successful applications of these tests in a few cases of human trichinosis.

In a critical study of the value of such tests in diagnosing trichinosis, Augustine and Theiler [32] confirmed the results of Bachman with animal experiments. They also found the precipitin test to be reliable in detecting established trichinosis in swine and man. False positives were obtained in individuals who had recently received quinine treatment for malaria. Certain of the arsenical compounds used in treating syphilis, and corrosive mercuric chloride also appear to affect this reaction in a similar manner. The skin test was found to be positive about the fourteenth day of infection and was of the immediate type in both swine and human beings. There is no evidence that the presence of other parasites influences either of these reactions.

Recently McCoy, Miller and Friedlander [33] used a somewhat different antigen from that employed by the authors previously mentioned. Their results were essentially similar to those of Augustine and Theiler.[32] According to McCoy and his associates, about 90 per cent of persons ill with trichinosis will show a positive skin test to the trichinella antigen.

More recently, Kilduffe [34] reported the use of the skin test on thirty-three individuals with trichinosis. His conclusions to the effect that it possesses no advantages over the finding of an eosinophilia must be discounted, because he used an antigen in a dilution of 1 to 100, read the reactions at the end of twenty-four hours, and classified his reactions according to the method used by Bachman in laboratory animals.

Maternowska [35] recently reported that the skin test in man and animals was specific, and Friedlander,[36] after several years' experience with the skin test at San Francisco and Rochester, N. Y., considers it a valuable aid in the diagnosis of the disease.

The antigen used in our series of cases was prepared according to the method of Bachman.[28b] The skin test was made by injecting 0.1 cc. of a 1:10,000 dilution of the trichinella antigen intradermally into the inner surface of the forearm. A similar amount of Coca's solution (the diluent of the antigen) was injected into the other arm as a control. The test was read within five minutes. Typically, a blanched wheal makes its appearance within this time. This rapidly increases in size until after one hour it has reached its maximum of from 10 to 20 mm. in diameter. Occasionally pseudopodia are formed, running out from the wheal. Also a pronounced erythema usually appears promptly about the wheal. After twenty-four hours the reaction

26. Brown, T. R.: Studies on Trichinosis, Bull. Johns Hopkins Hosp. **8**: 79 (April) 1897; Studies on Trichinosis, with Especial Reference to the Increase of the Eosinophilic Cells in the Blood and Muscle, the Origin of These Cells and Their Diagnostic Importance, J. Exper. Med. **3**: 315 (May) 1898.

27. Spink, W. W.: The Effects of Vaccines, Bacterial and Parasitic Infections on Eosinophilia in Trichinous Animals, Arch. Int. Med. **54**: 805-817 (Nov.) 1934.

28. Bachman, G. W.: (*a*) A Precipitin Test in Experimental Trichiniasis, J. Prev. Med. **2**: 35 (Jan.) 1928; (*b*) An Intradermal Reaction in Experimental Trichiniasis, ibid. **2**: 513 (Nov.) 1928.

29. Stoll, H. F.: Trichinosis, J. A. M. A. **92**: 791 (March 9) 1929.

30. Hunter, G. W.: Human Trichinella Spiralis Infections and the Bachman Precipitin Test, Am. J. Hyg. **13**: 311 (Jan.) 1931.

31. Swineford, Oscar, Jr., and Waddell, W. W., Jr.: Trichiniasis: Five Cases in One Family, with Results of Skin Tests, Virginia M. Monthly **59**: 28 (April) 1932.

32. Augustine, D. L., and Theiler, Hans: Precipitin and Skin Tests as Aids in Diagnosing Trichinosis, Parasitology **24**: 60 (March) 1932.

33. McCoy, O. R.; Miller, J. J., Jr., and Friedlander, R. D.: The Use of an Intradermal Test in the Diagnosis of Trichiniasis, J. Immunol. **24**: 1 (Jan.) 1933.

34. Kilduffe, R. A.: The Bachman Intradermal Reaction in Human Trichinosis, Am. J. M. Sc. **186**: 802 (Dec.) 1933.

35. Maternowska, I.: Intradermale Hautreaktion bei Trichinose, Zentralbl. f. Bakt. **129**: 284 (Aug.) 1933.

36. Friedlander, R. D.: The Present Status of the Diagnostic Intradermal Test for Human Trichiniasis, Am. J. M. Sc. **188**: 121 (July) 1934.

may have disappeared entirely, but usually a faint, pink, circumscribed area from 5 to 8 cm. in diameter remains at the site of the reaction.

In the present series, thirty-three of thirty-four patients gave positive skin tests. One patient was in a moribund condition and gave a negative skin test but a positive precipitin test. Eight patients gave negative skin tests on entry to the hospital, but from two to three weeks after the onset of the illness the tests became positive. This test has proved of great diagnostic value in patients who have acute gastro-enteritis, with skin tests at first negative for trichinosis but later becoming positive. A positive skin test has been noted as early as the fourteenth day after infection, but in most cases a positive reaction was not obtained until the seventeenth day. We have not found the size of the skin reaction, or the rate with which it appears and decreases, to bear a constant relationship to the severity or duration of a trichinous infection. It has been observed that a few apparently normal individuals give positive skin tests. This may be explained by the fact that some people are hypersensitive to any protein injected into the skin, or the reaction may be due to a previously unrecognized trichinosis. Theiler, Spink and Augustine [37] observed that patients may show a positive skin reaction seven years after an infection with Trichinella spiralis. Thus, it is not possible by means of the skin test to distinguish between acute trichinous infections and those which occurred some years previously. It was also observed that precipitins may be present in the blood serum after that length of time but are demonstrable only in flocculation tests.

The precipitin test is performed by overlaying 0.5 cc. of serum in a small tube with an equal amount of a 1:100 dilution of the antigen. A control test is run in a second tube with the same amount of serum overlaid with Coca's solution. The tubes are placed in a water bath at 37.5 C. for one hour. A positive test shows a white ring at the junction of the antigen and serum. Occasionally the ring may be formed immediately, and more often within an hour.

The precipitin test was performed in only nineteen of the cases, and it was positive in all of them, as was the skin test. The precipitin test usually became positive at the end of the fourth week of the infection. So far, we have not found a constant relationship between the duration or severity of an infection and the size of the ring or the time it takes for it to form. It has been noted that in a few doubtful cases the control tube may show a ring as well as the tube with the patient's serum and antigen. We are unable to explain this. The skin tests in these cases were also doubtful. We have continued to do precipitin tests on a few of the patients included in this series and have noted no change in the appearance of the reaction one year after the infection.

Biopsies.—Another diagnostic aid in trichinosis is that of excising a small piece of skeletal muscle and examining it microscopically for parasites. In thirteen of the thirty-five cases, biopsies were done. Twelve were interpreted as positive for trichinosis, and one was negative. However, several showed only chronic inflammation and no parasites. We believe that the biopsy is an unnecessary procedure, not only because of the uncertainty of finding parasites in a small piece of muscle but also because precipitin and skin tests are as reliable as the procedure of biopsy, which is, of course, an inconvenience to the patient. To illustrate how difficult it is to find larvae in muscle biopsies, one of us (D. L. A.) infected a pig, and later more than eighty bits of muscle were examined microscopically without finding the parasite. It was only after the diaphragm, masseter muscles and part of the tongue were ground up and digested in artificial gastric solution that a few larvae were found in the sediment.

Spinal Fluid, Blood and Stool Examinations.—Practically all textbooks of medicine and those concerning laboratory procedures mention as an aid in diagnosis the finding of larvae in either the spinal fluid, the blood or the stools. Our experience is that, in any case, such observations are rare and of little value as practical diagnostic procedures. In none of our cases were we able to demonstrate larvae in the stools. Lumbar punctures were done in three cases and no parasites were seen in the cerebrospinal fluid. In two cases a careful, unsuccessful search was made for the larvae in the blood.

COMMENT

It is emphasized again that trichinosis is not an uncommon disease. Its recognition and correct diagnosis depend on a careful history of the patient's illness. In thirteen of our cases it was learned that other members of the family were ill. The most reliable laboratory procedure is the careful study of blood smears for eosinophilia. Mildly ill persons and sporadic cases constitute a serious phase of the trichinosis problem. It is in these cases that the skin and precipitin tests are of great value. Patients with slight fever, a slight eosinophilia, and vague aches and pains extending over a period of several weeks should have skin and precipitin tests done for trichinosis. Finally, it should be remembered that trichinosis is a public health problem. The best available method for reducing the incidence of the disease is the thorough cooking of all pork products.

SUMMARY

1. Thirty-five sporadic cases of trichinosis occurring in and around Boston during the past three years were analyzed.

2. The most reliable diagnostic clinical aid in these cases was the presence of an eosinophilia.

3. The skin test usually becomes positive about the seventeenth day of the infection, and the precipitin test usually at the end of the fourth week. These tests are of especial diagnostic aid in the early stages of the disease, when they are first negative and later become positive. Mild, sporadic and chronic cases of trichinosis were often detected only by these tests.

4. Other laboratory procedures, such as searching for the parasite in the stools, blood and spinal fluid, are time consuming, and the larvae are only rarely found.

37. Theiler, Hans; Spink, W. W., and Augustine, D. L.: Unpublished data.

Disturbingly Lopsided.—And whether any one thinks more clearly and deeply than before about the social problems that face humankind and whether people as a whole are as contended and happy as they were in simpler times may well be doubted. Invention of course is an inevitable part of science, in so far as the scientist continually has to improvise things to help his researches, but the trouble comes when business takes both science and engineering into partnership and then through mass production abetted by the psychology of modern supersalesmanship makes the distribution of the economic benefits disturbingly lopsided.—Cushing, Harvey: The Humanizing of Science, *Science* **81**:137 (Feb. 8) 1935.

A METHOD OF EVALUATING CARDIAC PAIN IN CHILDREN

HAROLD C. LUETH, M.D.
EVANSTON, ILL.
AND
DON C. SUTTON, M.D.
CHICAGO

Pain is a valuable symptom in the diagnosis of cardiac conditions. In angina pectoris, for example, one patient may complain of a viselike constriction of the chest and another may merely experience a deep dull sensation that he dismisses as a transient numb feeling over the heart. This variation of response, as well as the different descriptions given by patients,[1] makes pain an equivocal symptom. However, it is not to be expected that all patients will give the same response to a given pathologic condition, nor even is it seen in the same individual at all times. Much of this apparent difficulty in the evaluation of pain can be overcome by taking a careful history and estimating the patient's sensitivity to pain by past experience.

We have long been perplexed by the child who complains of a pain over the heart. A complete history of this disorder or an attempt to make the child fully describe these sensations has often given no substantial additional information. In a few cases the diagnosis was clear after the parents gave the story of an acute chorea, an impending decompensation or an attack of arthritis, and in even fewer did an examination of the child reveal anything of note. Often a brief neuropsychiatric testing would demonstrate this symptom to be another manifestation of a "nervous" child. We were distressed, however, in a small group of children to find that this complaint was an early symptom of a severe carditis or that it ushered in a fatal endocarditis. Out of this confusion it was hoped that a means could be found to differentiate those cases in which cardiac pain was apparently a harmless symptom from those in which it was associated with an advancing pathologic process. Libman's[2] test appeared to fill these requirements; consequently it was used.

After a long study of this subject Libman devised a simple method of testing the pain response of a patient. Both of the examiner's thumbs are pressed against the mastoid bones; then the forefingers are slipped forward against the tips of the styloid processes. Normally, pressure over the mastoid causes no pain, which may be used as a control reading. The same amount of pressure applied to the styloid tips is painful to a few but painless to most individuals. The pressure should be applied in one direction, since rubbing the bones evokes the painful response of rubbing the periosteum. From the responses obtained from this test, Libman divided patients into different classes.

METHOD

One hundred children of the cardiac follow-up clinic of Cook County Hospital were used for these experiments. Children under 6 years of age were eliminated from this series, as it was believed that they might not fully understand the presence of minor cardiac sensations. They may complain freely of acute pain over the heart, as in an acute pericarditis, but palpitation, tachycardia and dull aches over the heart are rarely mentioned. The series represents an unselected group of 100 children between the ages of 6 and 15; 53 per cent were boys and 47 per cent were girls; 82 per cent were white and 18 per cent were Negroes.

All children were asked three questions: "Do you ever have a pain over your heart?" "Do you ever feel anything over your heart or left chest?" When an affirmative answer was given to these questions they were asked, "What does it feel like?" When a negative reply was given to the first two questions, the child was asked whether he experienced anything over his heart that felt or sounded like palpitation. Gentle tapping with the forefinger over the precordium and lightly striking the top of a metal bedside table with the blunt end of a fountain pen were believed to be close imitations of palpitation. Since these were highly suggestive procedures, children who gave affirmative answers to the latter question were questioned closely to ascertain if the sensations they felt might actually be palpitation.

Sensitivity to pain was tested by pressure over the mastoid process and then over the styloid process. This pressure was gradually increased, depending on the response of the child. When the patient did not complain, the pressure was the maximum that could be obtained by first pressing both thumbs together and then the forefingers, thus insuring a uniform stimulus. Several physicians of the clinic repeated these tests on some of the children and obtained the same responses that we had previously recorded. Before making the test, the examiner must be certain that there is no local disease in the region of the mastoid; otitis media, mastoiditis, enlarged postauricular glands, painful scars of old mastoidectomies, and skin abrasions or lesions preclude testing that area. In one child we had to confine the test to the right side, as he had just recovered from an otitis media and a mastoiditis, but this did not hinder the experiment; in fact, his results fit in well with the others of his group.

Three classes of responses were obtained and recorded. Those children who gave no evidence of pain in either region were designated class 1. Children showing a mild response of pain, who after questioning admitted slight degrees of pain or who volunteered the remark "It hurts a little" were placed in class 2. The third class consisted of those who evinced great pain during the test or who complained so bitterly when the pressure was applied that maximal amounts could not be used. Each class was in turn divided into two groups; P, those who had cardiac sensations and A, those who had none. Activity, as noted, includes pyrexias of more than 99.4 F. or pulse rates of from 110 to 130 for an average of three months or more; a recurrence of an articular inflammation, chorea or endocarditis; an increasing dyspnea or a threatening decompensation necessitating a return to the hospital or a convalescent home, or a rapid enlargement of the heart size.

RESULTS

The largest and most interesting group were the sixty-four patients who comprised class 1. Of this group, fifty-four did not complain of or notice any cardiac sensations (1 A) while ten did (1 P). Of the former group, forty, or 74 per cent, had inactive lesions; the remaining fourteen, or 26 per cent, showed activity. Unmistakable signs of activity were present in nine of the ten patients (90 per cent) of class 1 P. Three of these children had died, two of decompensated rheumatic carditis and one of bacterial endocarditis.

From the Department of Medicine, Northwestern University Medical School, and the cardiac follow-up clinic of Cook County Hospital.

1. Sutton, D. C., and Lueth, H. C.: Diseases of the Coronary Arteries, St. Louis, C. V. Mosby Company, 1932.
2. Libman, Emanuel: Observations on Individual Sensitiveness to Pain, J. A. M. A. **102**: 335-340 (Feb. 3) 1934.

Persistent tachycardia, from 110 to 128 per minute, and a prolonged fever were present in two cases. One patient is still convalescing from an acute endocarditis; another has had a prolonged pyrexia for months, and a third showed a recent extension to the aortic valve from an old mitral stenosis, accompanied by an enlargement of the left heart border. A youth with hypertension has maintained a systolic pressure of more than 190 mm. of mercury for the past two years. There is but one case in group 1 P in which no ascertainable signs of an active rheumatic infection are present.

Class 2 gave the widest distribution of cases to its subdivisions. Eighteen of these children, or 72 per cent, experienced no pain or distress whatever; six had active lesions, while twelve were inactive. Only seven, or 28 per cent, noted cardiac sensations (2 P), and the distribution of activity and inactivity was nearly equal; that is, three and four.

Eleven patients formed the last group, or class 3. As these were the children who reacted most violently to painful test stimuli, it is not surprising that all but one complained of cardiac distress. Four of these ten (3 P) showed active carditis, while six did not. The only one who did not complain of cardiac distress (3 A) had an inactive cardiac lesion.

The relationship of cardiac sensitivity and activity for the entire group is noteworthy. Twenty-seven per cent of the patients complained of cardiac sensations, and active endocarditis was seen in 36 per cent of the cases of this series.

COMMENT

Numerous objections to this type of experimentation naturally arise. Some might object that leading and too pointed questions were asked the children concerning their cardiac symptoms. True as this might at first seem, any considerable experience with children will show that great ingenuity is required to get a good history. The imitation of palpitation by tapping on the patient's chest was used with such good results in reticent or illiterate adult patients that it was tried on children, among whom it seems to enjoy a similar success. Uniform pressure was applied in all but a few cases, and even when different examiners tested the same patient a uniform response was always noted. This pain stimulus, therefore, must be approximately equal in all tests.

Classification of the groups on the basis of response was arbitrary, and consequently some difficulty arose concerning "borderline" cases. As class 1 and class 3 were quite definitely fixed, most of the questionable cases were put in class 2. This may in part explain the great variety of response found in the latter group. Also, activity and inactivity were more or less definitely separated. A fever with a mean temperature curve of more than 99.4 F. for a period of three months, or a pulse rate of from 110 to 120 over the same period of time, was accepted as an active rheumatic infection. A spread of the valvulitis to a new valve, a change in cardiac contour with the appearance of new murmurs or an alteration of heart tones, the presence of irregularities, such as gallop rhythm, dropped beat or auricular fibrillation, was evidence of an active carditis. While admitting that we may have overlooked cases of silent endocarditis from the list of active cases, we also wish to call attention to the great difficulty in their diagnosis.[3]

Pain in rheumatic heart disease of children has been variously discussed by different authors. Most of them mention pain and give the classic description of either the pain of an acute pericarditis or that of the decompensated heart.[4] Coombs[5] in his lucid monograph of this disease mentions in addition to the types just cited an anginal type, seen presumably in older children and adults, as well as milder dull pains, which he attributes to myocarditis. On the whole, there appear to be few references to "heart pain" in children; the work of Swift and Hitchcock[6] is the exception in this respect. They find it to be a common symptom in the child with a rheumatic fever and caution the practitioner that he must inquire after this symptom in children or it will be missed. The acute arthritic pains are often so severe that the mild cardiac pains are often overlooked. They found the intensity of precordial pain to be roughly proportional to the severity of cardiac damage. Individual sensibility to pain in this work was determined entirely by subjective means.

Libman's test is unique in that it makes it possible, in a number of cases, to determine a subjective symptom—pain—in an objective way. It is of course impossible to consider every complaint of every child, especially of those who are neurotic, and this pain sensitivity classification was therefore decided on. Unlike Libman, we did not call those children hyposensitive who experienced no pain on pressure over the bony prominences, as they constituted 64 per cent of the entire group. They were merely called class 1. The presence of heart sensations, i. e., pain or palpitation, in the group who normally do not complain of pain on pressure over a bony region is usually accompanied by active cardiac disease in the majority of cases. Despite the seemingly small number of cases in class 1 P, the large proportion showing active disease, as well as the degree and the severity of the lesions, seems to establish this rule. Only three deaths occurred in this entire series, all of which came from this subdivision. Even the other two groups in which cardiac pain was noted showed a much higher percentage of cardiac damage than any single group not presenting this symptom. A total of thirty-six patients had demonstrable pathologic changes of the heart, while a total of twenty-seven patients complained of precordial symptoms, again illustrating the close parallelism between cardiac damage and pain.

The disposition of the other cases is not so conclusive. In class 1 A about three fourths of the cases are inactive. This is about what is to be expected in a group of children who tolerate pain well and have no sensation about the anterior chest wall. Perhaps those cases which are active in this group represent hearts in which the rheumatic infection is progressing at such a slow rate that the pain mechanism is not involved. Class 2 presents such widely divergent results that no analysis is attempted. This is not surprising when it is remembered that it is not actually a class but merely an aggregation of those cases which fit in neither class 1 nor class 3.

Those children who were hypersensitive, class 3, experienced pains about the heart in 91 per cent of the cases. Pain over the heart (3 P) was about equally

3. Sutton, D. C.: Silent Endocarditis, Illinois M. J. **61**: 438-439 (May) 1932.

4. Ladd, Maynard: Acute Rheumatic Fever in Children, in Abt, Isaac: Pediatrics, Philadelphia, W. B. Saunders Company **6**: 50, 1925. White, P. D.: Heart Disease, New York, Macmillan Company, 1932, p. 331. Lewis, Thomas: Diseases of the Heart, New York, Macmillan Company, 1933.

5. Coombs, C. F.: Rheumatic Heart Disease, New York, William Wood & Company, 1934, pp. 144-153.

6. Swift, H. F., and Hitchcock, C. H.: Cardiac Pain in Rheumatic Fever, J. A. M. A. **90**: 678-683 (March 3) 1928.

divided between those having active disease (four) and those having none (six), thus giving rise to two explanations of the origin of pain in this class. In the first group it was probably the end result of active infection over a long period of time, which made the child not only sensitive to pain over the heart but to all painful stimuli, while the second group may be considered neurotic children without any active lesion. The single patient in class 3 A is also of this type. As might be further anticipated, seven, or 63 per cent, of the entire group had no demonstrable pathologic condition.

CONCLUSIONS

1. Children who do not experience pain after a simple pressure test usually do not complain of cardiac pain.
2. Those who complain of cardiac pain and not of pain after the pressure test almost always have demonstrable cardiac disease.
3. Those who complain of severe pain following pressure on a bony area usually complain of cardiac pain and often do not have any active cardiac lesion.
4. In the course of an acute rheumatic infection, cardiac pain and palpitation are valuable symptoms for the diagnosis of carditis. Unless they are specifically sought for, they will be frequently overlooked.

636 Church Street—30 North Michigan Avenue.

STERILITY AND THE X-RAYS

MAX HUHNER, M.D.
NEW YORK

Every dermatologist knows and has known for a long time that the x-rays in sufficient doses interfere with the spermatogenic function of the testicle or destroy it entirely. Consequently, when he uses this modality about the genital organs for therapeutic purposes he is careful to protect these organs from any possibility of being affected by the x-rays.

In my practice, however, I have had a few patients who, in spite of such protection, became sterile although previously fertile, and, as far as could be determined by the most painstaking investigation, this was the sole cause for the sterility. I would emphasize that the cases referred to were not treated by general practitioners or those who only occasionally employ the x-rays but generally by expert and experienced dermatologists, fully aware of the danger, and, according to the patients' statements, adequately protected the genitals. In most of the cases the x-rays had been given for some dermatologic condition about the thighs or perineum. As just mentioned, some of these patients had been of proved fertility before the application of the rays, either by reason of having impregnated their wives or from condom examinations, yet after such application condom specimens were found either to be absolutely devoid of any spermatozoa alive or dead or contained but few live or dead spermatozoa.

Purely as a result of this clinical experience, and ignoring for the time being any theoretical considerations, it has occurred to me that perhaps the protection usually given is not adequate enough and that somewhere there might be a leakage which allows the rays to get at the testicle in spite of such protection.

I will therefore report a few cases in which the patients had been perfectly fertile before and now have azoospermia, and then a few cases in which the patient came on account of sterility and, as far as could be determined, there was no other reason for the azoospermia except a previous application of the x-rays. In the second series of cases, however, there is no scientific proof that the organs were normal previous to the treatment, as no condom examinations had ever been made before such treatment.

CASE 1.—J. L. S. consulted me for sterility in September 1925. At that time he had been married two and a half years and his wife had a miscarriage a year before as the result of an automobile accident. Since then he had received roentgen treatments from a prominent dermatologist for a period of five months for psoriasis. The dermatologist informed me that protection had been used and that the dose of x-rays was too small to influence the testicles. Nevertheless, condom specimens examined by me and others were absolutely negative for spermatozoa. He never had a venereal disease. Feb. 6, 1926, after several negative condom examinations, I aspirated the right testicle and found no spermatozoa in the aspirated testicular fluid, showing that the azoospermia was testicular in origin. All condom examinations were made within an hour after coitus and after ten days' continence.

CASE 2.—R. L. was seen July 15, 1932, for sterility. In 1927 he received roentgen treatments for ringworm near the testicle without any protection whatever. Nevertheless a Huhner test (searching for spermatozoa in the female genitals after coitus) made three years later by a competent gynecologist showed numerous live spermatozoa in the female genitals. Four months after this examination, in January 1931, he again received roentgen treatments by another dermatologist for a rash on the abdomen and side, but now the testicles were protected. Six months after these treatments he came to me and a condom specimen showed absolutely no spermatozoa; neither of course did a Huhner test on his wife. I put him on increasing doses of the anterior lobe of pituitary extract, which he took for about six months, but spermatozoa never reappeared in the specimens. In a follow-up letter he informed me that another condom specimen examined by Dr. Hagner in Washington also proved negative.

CASE 3.—This patient came for sterility in 1933. His condom specimens showed a few dead spermatozoa as well as a few very lively ones. It seems that the spermatozoa produced by the testicles were about normal but that their number was markedly diminished. The specimens were examined about one and a half hours after coitus and after ten days' continence. His history shows that his semen, as examined several times by a prominent gynecologist in 1932, was absolutely normal. He then submitted to six roentgen treatments to the perineum for pruritus, and after that the condom specimens were abnormal. The dermatologist had used a protective device to the testicles. I put him on increasing doses of the anterior lobe of pituitary extract with the result that another specimen examined five months later was absolutely normal. All know, of course, that even in normal cases there are variations with regard to the number of spermatozoa found in a specimen and that once in a while the number may be far below normal; but in this case repeated specimens taken each time after a long period of continence showed a marked diminution in the number, so that the condition cannot be considered accidental.

CASE 4.—N. R. was seen in 1925 for sterility. At the time he had been married five years, but his wife had had a miscarriage four years before his visit to me. He never had any venereal disease and coitus was normal. About one year after his wife's miscarriage he received roentgen treatments once a week for a period of five months for a skin disease in both groins. The testicles were protected. Several condom specimens examined within a short time after coitus and after long periods of continence always showed absolute azoospermia.

DOUBTFUL CASES

CASE 1.—M. S. consulted me for sterility in 1931. He had been married four and a half years, but during the first year he employed contraceptive measures. He never had venereal disease or a swollen testicle. Coitus was normal. About a

year after marriage a dermatologist applied x-rays to the testicle for a skin disease. Altogether he had five treatments. Repeated condom examinations thereafter were negative for spermatozoa and no spermatozoa were found by me on aspirating the testicles. He did not reply to my follow-up letter.

In this case, however, it is not known whether the patient had been sterile prior to the roentgen treatments, as he had employed contraceptive measures till then. It is true that there were not present any of the usual causes for azoospermia; nevertheless this must be considered a doubtful case.

CASE 2.—J. F. had had three roentgen treatments to the scrotum in 1925, although, he said, the testicles were protected. A year later he married and for the first three years used contraceptive measures. His wife then went to Dr. Vineberg for sterility, who found azoospermia in a condom specimen and referred him to me. Several condom specimens examined by me showed the same condition. The patient never had any venereal disease or any other causative factor to account for the sterility. Here again, as a condom specimen was never examined prior to these treatments, a definite conclusion cannot be drawn.

COMMENT

The number of cases recited is few, but it is only recently that I have investigated this matter, and many of my cases of male sterility date back many years, so that it was impossible to get in touch with them. I have no doubt, however, that there were more cases, especially as my histories show many cases of azoospermia in which no cause could be found for the condition. Of course some of these were probably congenital in origin, but there might have been some due to the cause under discussion; but, as before said, I could not communicate with the patients. It is also suggestive to note that in many of these cases the testicles as palpated were not small or atrophic but appeared perfectly normal.

Ordinarily it would have been more scientific to wait till I had obtained a larger number of cases to report, but sterility is such a very serious condition, often causing the most intense suffering and unhappiness and at times leading to divorce, that I consider it more humane to call attention to this warning at the earliest possible time rather than wait for more cases to develop.

It must be recognized that different testicles react differently to the influence of the x-rays, some being much more sensitive than others, so that what might be adequate protection in some cases would not at all be for others. While I was discussing the condition with a prominent and experienced dermatologist, he informed me that he used a heavy piece of rubber for protection and that although he admitted that some of the x-rays might penetrate this rubber sufficiently to develop a film, not enough would penetrate to affect the testicles. However, in discussing the matter with an expert roentgen therapist, I was informed by him that an ordinary piece of rubber was not, in his opinion, adequate protection, and in order to obtain such protection it was necessary to add a lead plate as well as an aluminum plate to the device.

It might be objected that in the foregoing discussion no mention is made of the dosage of x-rays received by the patient. In the first place, in most of the cases reported, all my information came through the patient himself, who obviously could give no information on this point. But the question of dosage is entirely aside from my purpose in this paper. As before said, the cases were treated by expert dermatologists who at the time considered the dosage given plus the local protection adequate enough to prevent any testicular damage, and it is my object to show that at times this is not the case.

CONCLUSIONS

In some cases the testicles are so sensitive to the action of the x-rays that doses which are ordinarily considered harmless may cause sterility. The protective devices ordinarily employed to shield the testicles from the action of the x-rays when applied near the genitals may not be adequate enough to prevent such harm.

441 West End Avenue.

ENTEROGENOUS CYSTS OF THE DUODENUM

REPORT OF A CASE AND REVIEW OF THE LITERATURE

CLARENCE E. GARDNER JR., M.D.
AND
DERYL HART, M.D.
DURHAM, N. C.

Cysts and diverticula of the gastro-intestinal tract have been noted frequently in the literature. They represent a congenital abnormality that presents a problem to the clinician in diagnosis and to the surgeon in treatment. Although diverticula of the duodenum are not infrequent, cysts of the duodenum have been noted in the literature only six times. The present case is reported in the belief that every additional report of a condition so rare may be utilized in obtaining a more prompt recognition and better understanding of future cases.

REPORT OF CASE

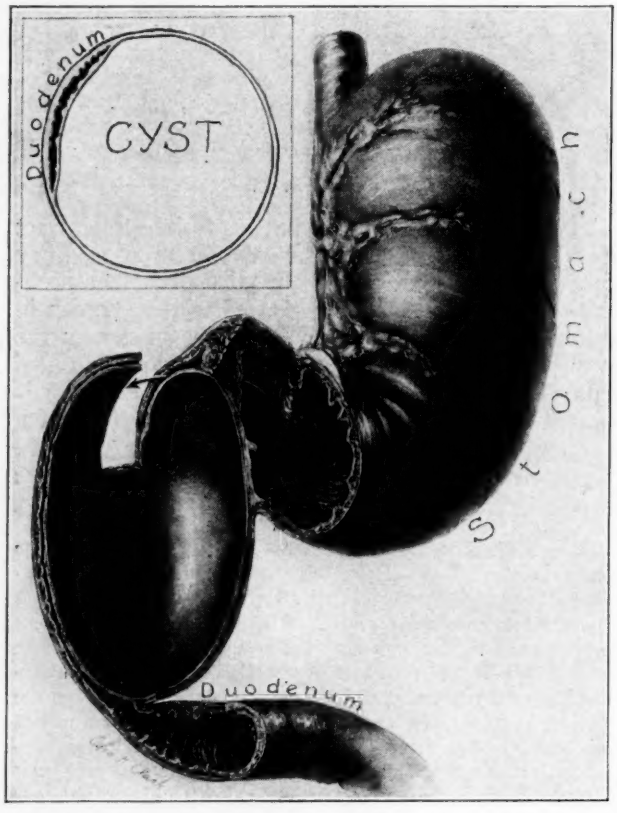
History.—H. S., a white girl, aged 15 years, admitted to the medical service of the Duke Hospital, Sept. 21, 1931, complained of intermittent attacks of abdominal pain and vomiting of twenty-two months' duration. Her birth and development had been normal, although she had always been frail. At the age of 6 months and also at 2 years she had attacks of unexplained hematemesis and melena. At the age of 3 years she complained of vague abdominal pain and on one occasion passed gross blood in the urine. These vague abdominal pains continued intermittently, and when she was 7 the appendix was removed. Ten days after this operation severe abdominal pain recurred, felt most acutely in the right flank and upper part of the abdomen. She was at first thought to have a kidney stone, although this diagnosis was later changed to tuberculosis of the kidney. After several months all symptoms disappeared, and she remained in good health for five years. Twenty-two months prior to admission she began complaining of intermittent attacks of dull aching pain in the right upper part of the abdomen, often accompanied by vomiting. Associated with these she felt a lump in the upper part of the abdomen on the right side, which disappeared between attacks. These attacks lasted for from one to two days and recurred at intervals of from seven to thirty days up to the time of admission. The pain was never cramping nor was there any characteristic radiation. It was thought that the vomitus was bile tinged at times. It had never contained blood since the attacks in infancy, and food residue had not been noted. She had never been jaundiced. There had been no urinary or menstrual symptoms. Bowel movements had always been regular and there had been no blood, pus or mucus in the stools.

Physical Examination.—The temperature was 37.2 C. (99 F.), the pulse 92; the respiration rate 22, and the blood pressure 118 systolic, 80 diastolic. She was 152 cm. tall and weighed

From the Department of Surgery, Duke University School of Medicine.

41.6 Kg. She was rather small but normally developed and was in no discomfort. The skin was pale and somewhat sallow but not jaundiced. There were palpable axillary and epitrochlear lymph nodes. The abdomen was flat and moved freely with respiration. Under the right costal margin there was a slight visible fulness. In this area on palpation an indefinite, moderately tender mass in the region of the gallbladder could be felt. It seemed to be smooth, about 10 cm. in diameter, and did not descend with respiration. It could not be felt in the flank. The abdomen otherwise was normal and the remainder of the general physical examination was negative.

The blood showed a hypochromic anemia (red blood cells 4,460,000, hemoglobin 8.5 Gm., 60 per cent Sahli, color index 0.68, white blood cells 7,400). The Wassermann reaction of the blood was negative. The urine showed no abnormalities. Repeated stool examinations were negative for blood, pus, mucus and parasites.



Relation of the cyst to the duodenum and stomach. The cyst occupies a submucus position in the lower and anterior wall of the duodenum and bulges into the duodenal lumen, compressing it into a narrow slit.

A plain roentgenogram of the abdomen showed a rounded, smooth, soft tissue mass on the right side of the vertebral column extending from the eleventh dorsal to the third lumbar vertebra. On fluoroscopic examination the mass did not descend during inspiration. A pyelogram on the right side showed normal kidney calices and demonstrated no connection between the mass and the kidney. Roentgenograms of the barium sulphate filled stomach and duodenum showed no abnormality. With a barium sulphate enema the colon filled normally and showed the hepatic flexure to be pushed down by the mass. Cholecystograms showed a small normally filled gallbladder, which contracted well after the fat meal.

Clinical Course.—The patient remained in the hospital nine days, during which time she was afebrile and free from all symptoms. After the first day the mass in the right upper part of the abdomen, which was indefinite on the first examination, could no longer be felt. As an operation was not agreed on, she returned home, October 1.

Readmission.—The patient was readmitted, November 11, with a history of having had, four days after discharge, a severe attack of pain in the right upper part of the abdomen, with repeated vomiting of two days' duration. Since then she had had repeated less severe, though similar, attacks. Examination showed essentially the same condition as on the first admission. An indefinite mass in the right upper part of the abdomen could be felt as on the first examination. Operation was performed, November 21. The preoperative diagnosis was choledochus cyst.

Operation.—The abdomen was opened through a right rectus incision. General abdominal examination was negative except for the right upper quadrant. The upper third of the duodenum was markedly dilated and it was impossible to empty the dilated part either into the stomach or into the lower part of the intestine. The distended area felt like a cyst. This cystic mass was surrounded by the vessels and muscles of the duodenum and seemed to protrude through the pylorus and into the lower 2 or 3 cm. of the stomach. The remainder of the stomach was normal in size and appearance. From external examination it was impossible to determine the relationship of the duodenal lumen to this cystic mass. The gallbladder was not distended and the common bile duct was normal in size. The stomach was opened just above the pylorus to permit inspection of the interior of the stomach and duodenum. The lumen of the duodenum was then seen to lie on the upper dorsal side of the cyst as a flattened mucous membrane lined channel, and the cystic mass seemed to lie within the duodenal wall, as shown in the accompanying illustration. It was evidently impossible to excise the cyst, which was so closely associated with the wall of the duodenum and the pancreas, and possibly with the pancreatic duct, the ampulla of Vater, and the bile duct. The cyst was aspirated and a thin, clear, slightly greenish fluid was obtained. This suggested the presence of bile pigments, although the fluid did not have the appearance of bile and on subsequent chemical examination it was negative for bile pigments.

The cyst was opened from within the duodenum, the incision going through the mucous membrane, submucosa, fibromuscular wall of the cyst and the mucous lining of the cyst. Examination of the interior of the cyst showed no communication with the lumen of the intestine. The muscular wall of the intestine apparently went entirely round the cyst and the duodenal lumen. Working from within the stomach an anastomosis, which would about admit two fingers, was made between the cyst and the duodenal lumen. The incision in the wall of the stomach was then closed. The abdominal incision was closed in layers with catgut, silkworm gut stay sutures and silk for the skin.

Postoperative Course.—Recovery after operation was uneventful and the patient left the hospital free from symptoms on December 10. She was readmitted to the hospital twelve days later, having had another attack similar to those suffered before operation. This began on the day prior to admission and lasted for three days. Two weeks later she had another attack of twelve hours' duration with a chill and elevation of temperature to 38 C. (100.4 F.) and a pulse rate of 128. Two days later an erythematous patch appeared on the left cheek and numerous lesions of herpes simplex on the lips. These lesions lasted about a week, during which time she was afebrile and without abdominal symptoms. She was discharged free from symptoms, Jan. 21, 1932. Her mother wrote, Jan. 4, 1934, that since the last date she had been free from all digestive symptoms except for an attack of pain in the right upper quadrant and vomiting of twelve hours' duration in November 1932.

REVIEW OF PREVIOUSLY REPORTED CASES

Sanger and Klopp [1] in 1880 reported the case of a new-born child who had died during a difficult delivery. The viscera were transposed. The abdomen contained five cysts, one from an accessory liver, one from an accessory bile duct and three from the intestine. One of the latter had its origin in the duodenum. This duodenal cyst was about the size of a walnut and microscopically was composed of all the normal layers of the duodenal wall.

1. Sanger, M., and Klopp, A.: Zur anatomischen Kenntniss der angeborenen Bauchcysten, Arch. f. Gynäk. **16**: 415, 1880.

Roth [2] in 1881 reported the case of a new-born male infant who died a few minutes after delivery. The abdomen was tremendously distended and contained a large pedunculated thin walled cyst arising in the duodenum. The cyst did not communicate with the lumen of the intestine. The cyst wall was found to contain all the layers of the normal intestine. This patient also had an enterogenous cyst in the right posterior mediastinum situated close to the esophagus and evidently derived from it.

Meyer [3] in 1919 reported the case of a female infant, aged 3 weeks. Birth was normal and first feedings were retained. At the age of 13 days she began vomiting after each feeding and when seen at the age of 3 weeks she was emaciated and dehydrated and was not retaining any of her feedings. No abnormal abdominal changes were noted. The diagnosis of pyloric stenosis was made and the child died four days later, no operation having been performed. At autopsy the pylorus and first portion of the duodenum were found dilated and in the medial wall of the duodenum was a cyst the size of a hen's egg. This extended from the pylorus to the ampulla of Vater and bulged into the lumen of the duodenum obstructing it. No communication between the lumen of the duodenum and that of the cyst could be demonstrated. Microscopically the cyst wall was composed of the normal layers of intestine, and the cyst was seen to occupy a submucus position in the duodenal wall.

Waugh [4] reported the fourth case in 1923. The child, a female infant, aged 19 days, had been regurgitating food immediately after feedings since birth and had been steadily losing weight. In the two or three days prior to examination she had not retained any of her feedings. On examination she was found to be undernourished. A firm, indefinitely rounded mass could be palpated on the right side of the abdomen extending from the iliac fossa to the costal margin. At operation a cystic mass presented on the outer surface of the colon and displaced the hepatic flexure and transverse colon anteriorly. The peritoneum lateral to the hepatic flexure was incised and a retroperitoneal cyst was shelled out as far as the midline. Here the cyst was found to be intimately connected with the posterior wall of the duodenum. Examination of the duodenum showed its second portion stretched like a ribbon across the anteromedial aspect of the cyst. The cyst was opened, no communication was demonstrated with the lumen of the duodenum, and the cavity of the cyst was packed with gauze, which was brought out through the abdominal incision. Following removal of the gauze the child did well for six weeks, at which time it began to vomit again. One week later, at a second operation, the cyst was found to have refilled. It was evacuated and its wall sutured to the aponeurosis of the abdominal wall. The child died six days later of pneumonia. Microscopic section of a portion of cyst wall removed at the first operation showed it to be composed of an inner circular and outer longitudinal muscular coat.

Maddox [5] reported the fifth case in 1927 in a 3 months old child whose sex was not recorded. Since the age of 6 weeks the patient had vomited following feedings and had not gained in weight. On examination the child was found to be undernourished and dehydrated. Gastric peristalsis was visible in the epigastrium, and a movable mass 6.25 cm. by 4.3 cm. was palpable in the region of the pylorus. At operation the first portion of the duodenum was found to end in a large fusiform cystic tumor the size of a goose egg. From the lower pole of this mass emitted the attenuated third portion of the duodenum. The child's condition was too poor to permit further operation and it died sixteen hours later. At autopsy the mass seen at operation was found to be a thin walled cyst, which projected into and obliterated the lumen of the duodenum. Microscopically its wall was composed of an inner layer of poorly developed columnar epithelium, a middle layer containing scattered plain muscle fibers with no differentiation into circular or longitudinal layers and an outer adventitious coat.

Smith [6] reported the sixth case in 1930. The patient, a 2 weeks old female infant, had vomited after practically every feeding since birth and had not gained in weight. The vomitus did not contain bile, and greenish stools had been passed. Examination revealed an undernourished baby with a distended abdomen. At times there was visible gastric peristalsis and it was thought that a tumor was present beneath the right costal margin. A tentative diagnosis of congenital pyloric stenosis was made. At operation two weeks later the first portion of the duodenum was found to be enormously distended. It was decided to perform a duodenojejunostomy. When the supposedly distended intestine was incised a large amount of serous fluid escaped, revealing the true condition—a cyst in the anterior wall of the duodenum. There was no communication between this cyst and the intestinal lumen. The stomach was opened and dilators were passed with ease through the pylorus and the upper part of the duodenum. The stomach was closed and the cyst drained externally. The child died one week later. At autopsy the cyst was found to be reduced to the size of a pea.

ETIOLOGY

As emphasized by Evans,[7] there can be little doubt that cysts which reduplicate all the layers of the normal intestine have their origin in defects of development of the intestinal tract. Lewis and Thyng,[8] in a study of the embryo of the pig, rabbit and man, regularly found knob-like diverticula along the entire intestinal tract. These diverticula appeared first in the duodenum and later along the entire small intestine, being most numerous in its terminal portion. In only one embryo were they found in the colon. Similar diverticula were also found along the bile ducts and probably explain the origin of the choledochus cyst, a condition that we had suspected in our patient. They found that these diverticula may persist, degenerate and disappear, or become detached in the form of epithelial nodules or cysts.

It is easy to understand how a cyst thus formed may occupy any position within the intestinal wall—submucous, intermuscular or subserous—or that it may occupy any position around the intestinal wall—mesenteric, antimesenteric or any intervening segment. A cyst on the mesenteric border in addition may lose its attachment to the intestine and occupy any position between the two layers of the mesentery.

2. Roth, M.: Ueber Missbildungen im Bereich des Ductus Omphalomesentericus, Virchows Arch. f. path. Anat. **86:** 371, 1881.
3. Meyer, Curt: Ein Beitrag zur Kenntniss der Enterocystome im Säuglingsalter, Ztschr. f. Kinderh. **21:** 272, 1919.
4. Waugh, O. S.: Congenital Cyst of the Duodenum, Surg., Gynec. & Obst. **37:** 785 (Dec.) 1923.
5. Maddox, Kempson: Cyst of Duodenum Simulating Pyloric Obstruction, M. J. Australia **1:** 900 (June 18) 1927.
6. Smith, R. E.: A Case of Enterocystoma of the Duodenum Simulating Congenital Pyloric Stenosis, Guy's Hosp. Rep. **80:** 463 (Oct.) 1930.
7. Evans, Arthur: Developmental Enterogenous Cysts and Diverticula, Brit. J. Surg. **17:** 34 (July) 1929.
8. Lewis, F. T., and Thyng, F. W.: The Regular Occurrence of Intestinal Diverticula in Embryo of the Pig, Rabbit and Man, Am. J. Anat. **7:** 505, 1907.

DIAGNOSIS

In none of the cases reported has the diagnosis been made before operation. Waugh considered his patient to have a duodenal obstruction from an unknown abdominal tumor. Smith diagnosed his patient as having a congenital pyloric stenosis. Meyer's patient was thought to have pylorospasm, while we thought our patient had a choledochus cyst. All the patients had a palpable abdominal tumor except that of Meyer, and all the patients except ours were infants. The most important diagnostic points are the presence of a tumor in the region of the duodenum and the signs and symptoms of duodenal obstruction.

TREATMENT

Unless the duodenal cyst is in a favorable position, it is not likely that excision will be possible. Some form of drainage of the cyst will be necessary. In the two cases in the series in which attempts to correct the abnormality were undertaken, the cyst was drained externally. In one case the cyst refilled after two months and the child died following a second operation. In the other, the child died one week following operation.

We believe that, in those cases in which excision is not possible, the procedure of choice is permanent internal drainage of the cyst into the intestinal tract. This can be accomplished, as in our case, by an anastomosis between the cyst and the duodenal lumen. The drainage might be accomplished as well by an anastomosis between the cyst and the jejunum, provided a jejunojejunostomy is also performed. With the latter method of treatment the diverticulum resulting from the anastomosis would be less likely to become filled with intestinal contents. We thought that the three attacks which occurred in our patient following operation were caused by this complication, and we considered using the latter plan of treatment as outlined if the attacks had continued. We now feel that our patient, having been free from symptoms for fifteen months,[9] will require no further surgical treatment, since the resulting duodenal diverticulum has been continually compressed by the normal duodenal musculature that surrounds it. The palpable mass has not been present since operation.

SUMMARY

1. A cyst of the duodenum was successfully treated by anastomosis with the intestinal tract.

2. Six cases of this rare condition have been collected from the literature, with a mortality of 100 per cent.

3. Three of the collected cases were treated surgically, two by external drainage.

4. The operation of choice seems to be permanent internal drainage into the intestinal tract.

5. There are two methods of accomplishing this, one having been used in the case here reported.

6. No case has been diagnosed before operation or autopsy. The symptoms are those of duodenal obstruction, with a palpable mass in the right upper part of the abdomen.

7. An embryonic diverticulum is the probable origin of the cyst.

8. Choledochus cysts probably have a similar origin from the persistance of diverticula that occur along the bile ducts during embryonic life.

Duke Hospital.

9. A recent note from the patient's mother states that she has been entirely free from symptoms since November 1932.

APIOL POLYNEURITIS

REPORT OF A CASE

ROBERT DENISON, M.D.
HARRISBURG, PA.
AND
J. C. YASKIN, M.D.
PHILADELPHIA

Prior to 1931, cases of polyneuritis caused by apiol had never been reported. The first reports came from Holland [1] and Yugoslavia.[2] Later cases were reported from Germany, France and other European countries.[3] A careful perusal of the British and American literature did not reveal such reports.

REPORT OF CASE

Mrs. H. F., aged 25, admitted to the Harrisburg Hospital, Aug. 10, 1934, with an irrelevant family and past history, complained of diarrhea, chills and fever, pain and swelling in the ankles, and abdominal pain. July 20, 1934, she had attempted to terminate an early pregnancy by taking eighty-nine capsules of Savatan and fifty emmenagogue tablets over a period of two or three days. Savatan is a proprietary preparation, each capsule containing 2 minims (0.13 cc.) of apiol, 1 minim (0.06 cc.) of oil of tansy, and 1½ minims (0.1 cc.) of oil of savin. The following day a severe gastro-enteritis developed with nausea, vomiting and generalized abdominal pain. Diarrhea followed on the next day and persisted until the middle of August. Chills, fever and sweats occurred later, with an extremely painful and swollen throat. On admission to the hospital, she was prostrated with a high fever and a relatively slow pulse. In the succeeding few days, an intractable tympanitis, severe epistaxis and a generalized rash resembling arsenical poisoning developed. At this time she complained of marked numbness in both hands and feet, which was followed by a pronounced hyperesthesia and the loss of power in the distal extremities. Masses suggesting condylomas appeared in the perineum, but studies with the dark field did not reveal spirochetes. The blood Wassermann reaction was negative. The urine revealed a few granular and hyaline casts, with a slight amount of albumin; the blood count showed a moderate leukopenia.

Read before the Philadelphia Neurological Society, Oct. 26, 1934.

1. ter Braak, J. W. G.: Een "epidemie" van polyneuritis van bijzonderen oorsprong, Nederl. tijdschr. v. geneesk. **75**: 2329-2339 (May 2) 1931.

2. Stanojević, L., and Vujić, V.: Ueber gehaufte toxische Polyneuritiden nach Gebrauch, eines Abreibungsmitels, Med. Klin. **27**: 1821 (Dec. 11) 1931. Rechnitz, E.: Toxic Polyneuritis from Apiol Capsules Used to Produce Abortion, München. med. Wchnschr. **79**: 100 (Jan. 15) 1932.

3. These include:

Reuter, A.: Use of Apiol as Abortifacient as Cause of Characteristic Form of Polyneuritis, Klin. Wchnschr. **11**: 286 (Feb. 13) 1932.

Jagdhold, H.: Severe Polyneuritis Following Use of Apiol as Abortifacient, Deutsche med. Wchnschr. **58**: 623 (April 15) 1932; Severe Polyneuritis Caused by Tricresyl Phosphate Content of Capsules of Apiol as Abortifacient, Verhandl. d. deutsch. Gesellsch. f. inn. Med., Kong. 44, pp. 423, 1932.

Hellmuth, L., and Grün, R.: Polyneuritis Following Subacute Poisoning with Apiol Taken to Produce Abortion; Case, Deutsche med. Wchnschr. **58**: 695 (April 29) 1932.

Wittke, J.: Toxic Polyneuritis from Apiol, Med. Welt. **6**: 916 (June 25) 1932.

Auer, A.: Polyneuritis from Apiol Used as Abortifacient, Fortschr. d. Therap. **8**: 634 (Oct. 25) 1932.

Gsell, O., and Lüthy, F.: Polyneuritis Caused by Triorthocresyl Phosphate Content of Capsules of Apiol Used as Abortifacient, Schweiz. med. Wchnschr. **62**: 577 (June 18) 1932.

Guttmann, L.: Peripheral Paralysis Caused by Presence of Neurotropic Poison, Tricresyl Phosphate Contained in Abortifacient Apiol, Med. Klin. **28**: 716 (May 20) 1932.

Kastan, M.: Neuritis Resulting from Use of Apiol as Abortifacient, Deutsche med. Wchnschr. **58**: 1288 (Aug. 12) 1932.

Roger, H.: Apiol Polyneuritis, Rev. neurol. **1**: 1427 (June) 1932.

Misgeld, J.: Polyneuritis Caused by Use of Apiol, Deutsche med. Wchnschr. **58**: 1925 (Dec. 2) 1932.

Nikolitch, A., and Alfandary, I.: Polyneuritis After Use of Apiol as Abortifacient, Encéphale **28**: 116 (Feb.) 1933.

Mann: Paralysis of Extremities Following Use of Apiol as Abortifacient: Three Cases, Arch. f. Psychiat. **98**: 282, 1932.

Horovitz, F.: Polyneuritis from Apiol Used as Abortifacient, Cluj. med. **14**: 152 (March 1) 1933.

Girard and Gamaleia: Polyneuritis Caused by Apiol, Rev. méd. de l'est. **61**: 454 (June 15) 1933.

Geithner, R.: Multiple Neuritis Caused by Use of Apiol as Abortifacient: Two Cases, Deutsche med. Wchnschr. **59**: 773 (May 19) 1933.

Examination of the urine and feces for arsenic was negative. The neurologic examination, made August 27, showed the following:

The mentality was quite clear. The patient was cooperative and answered questions slowly but accurately.

Examination of the cranial nerves was entirely negative in every detail. There was a slight weakness of the shoulder girdle muscles on both sides, perhaps more marked on the right side than on the left. There was no visible or palpable atrophy and there were no tremors. A very definite weakness of the biceps, triceps and supinators in both forearms was apparent. There was a pronounced weakness of the muscles of the right hand with little atrophy of the interossei. The power in the left hand was somewhat better, but there was much atrophy of the interossei in the muscles of the thenar eminence. The weakness in the hands was strikingly greater than in the forearms, and in the latter it was much greater than in the arms. The biceps and triceps reflexes were bilaterally abolished. There was tenderness all over the nerve trunks of the upper extremities, and this was most marked in the arms. There was a complete loss of sense of position and vibration up to the elbow on both sides. Touch was likewise diminished over the same area, while the tests for pain and temperature gave at times variable responses, especially in the most distal parts of the extremities. Pain and temperature were inaccurately preserved, while at other times the response was one of overaction.

The musculature of the trunk could not be tested satisfactorily as the patient was too weak to sit up. The abdominal reflexes could not be obtained.

There was no appreciable wasting nor were there tremors in any groups of the muscles in the lower extremities. She was unable to move the ankle joint in any direction, nor could she move any toes. She was barely able to flex the knees or the hips. The feet were supported by a pillow to prevent them from dropping. The knees and achilles jerks were entirely abolished. There was barely any response to plantar irritation. There was a very marked tenderness on pressure all over the nerve trunks, which was more pronounced in the calves of the legs and on pressure over the feet. The sense of vibration and position was entirely abolished in the feet, and the sense of vibration was entirely abolished as far as the knees. The response to pain and temperature was similar to that of the upper extremities, the hypalgesia and hypothermalgesia extending to about the upper third of the legs.

The neurologic examination was repeated October 24. At this time the patient was still paralyzed in both hands and feet, although there was a slight improvement in the motor power of the arms and legs. There was no appreciable improvement in the sensory status for vibration, deep position, tactile discrimination, pain, temperature and light touch. The biceps, triceps, knee jerks and ankle jerks were still abolished. Nerve trunk tenderness was still present but less marked. Electrical tests were not made.

COMMENT

The subject of polyneuritis following the use of apiol is well described by ter Braak and Carrillo,[4] who collected thirty-seven cases from the literature and reported thirteen cases from Holland. According to these authors the average clinical course is as follows: Several days following the ingestion of the apiol preparation, variable gastro-intestinal symptoms appear, which subside in two or three days. A period of latency may then prevail, which may last from two to three weeks, with an average of seventeen days. Cramps appear suddenly in the muscles of the legs at the end of this period, and this is followed on the next day or two by paresthesia and weakness of the feet. About a week later paresthesias and weakness appear in the hands. The weakness then becomes progressively greater, while the pain and paresthesia diminish in intensity. About two weeks after the onset of the neuritis there is usually found considerable weakness and some atrophy of the muscles of the hands and of the feet, while the more proximal muscles are affected but slightly, if at all. Pain and objective sensory changes are absent or are only slight. The biceps and triceps reflexes are preserved; the patellar reflexes are somewhat increased, while the achilles reflex is absent. There are usually found diminished responses to faradic stimulation and some other evidences of electrical reaction of degeneration. Fibrillary tremors are not observed. Spinal fluid studies and other laboratory investigations are negative.

The condition becomes stationary after two or three weeks, while the atrophy and electrical reactions of degeneration become more pronounced. It is not until a half year after the appearance of symptoms that improvement really begins, but eventually these patients make an almost complete recovery. Ter Braak and Carrillo stress the importance of the latent period, the purely motor character of the neuritis, and the predilection for the symmetrical and distal muscle groups.

Our case differs somewhat from the European variety. At the outset there were severe gastro-intestinal symptoms and marked skin and mucous membrane reactions, which are not mentioned in the literature. The duration of the latent period was twenty-one days. The neurologic involvement was somewhat more extensive than in the cases reported in the European literature, appearing, however, preeminently motor, distal and symmetrical. The fact that our patient ingested an exceedingly large dose of the drug in a short period of time may help to account for the severity of the symptoms.

All the cases reported would tend to show that the process is limited to the peripheral nerves and that there is no involvement of the central nervous system. The cause of this neuritis is not due to apiol[5] but to triorthocresyl phosphate, which is contained in the abortifacient. Apiol, which is an extract of parsley, is in itself nontoxic. The fact that triorthocresyl phosphate is capable of producing neuritis has been known for a long time. In 1899 Lorot[6] described a case of polyneuritis following the use of creosote phosphate in the treatment of pulmonary tuberculosis. Similar cases were reported by Loewenfeld,[7] Wertheim Salomonson,[8] Huet,[9] Sanz[10] and Bertolani.[11] Lastly, the jamaica ginger paralysis in the United States in 1930[12] also was traced to triorthocresyl phosphate. It is interesting to note that the clinical course of the cases treated for pulmonary tuberculosis, the cases of jamaica ginger paralysis[13] and those due to the ingestion of apiol show

4. ter Braak, J. W. G., and Carrillo, R.: Polyneuritis from Presence of Tricresyl Phosphate in Apiol Used as Abortifacient, Deutsche Ztschr. f. Nervenh. **125**: 86, 1932.

5. van Itallie, L.; Harmsma, A., and van Esveld, L. W.: Chemical and Pharmacologic Study of Apiol Preparations; Occurrence of Polyneuritis Following Their Use as Abortifacients, Arch. f. exper. Path. u. Pharmakol. **165**: 84, 1932. Kalbfleisch, L.: Peripheral Neuritis Due to Triorthocresyl Phosphate Content of Apiol. ibid. **171**: 439, 1933.

6. Lorot: Les combinasions de la creosote dans le traitement de la tuberculose pulmonaire, Paris thesis, 1899.

7. Loewenfeld, L.: Ueber Lähmungen nach dem Gebrauche von phosphorsaurem Kreosot, Centralbl. f. Nervenh. u. Psychiat. **26**: 237, 1903.

8. Wertheim Salomonson, J. K. A.: Toxische Polyneuritis bei einem Phthisiker, Neurol. Centralbl., 1900, p. 555.

9. Huet, W. G.: Neuritis, verursacht durch Creosotum phosphoricum, Neurol. Centralbl. **26**: 60, 1907.

10. Sanz, F.: Un caso de neuritis por el fosfato de creosota, Siglo med., 1908.

11. Bertolani, A.: Le paralisi da fosfato di creosoto, Riv. sper. di freniat. **40**: 113, 1914.

12. Smith, M. I.; Elvolve, E., and Frazier, W. H.: Pharmacological Action of Certain Phenol Esters, with Special Reference to Etiology of So-Called Ginger Paralysis, Pub. Health Rep. **45**: 2509 (Oct. 17) 1930.

13. Smith, M. I., and others: Pharmacological and Chemical Studies of the Cause of So-Called Ginger Paralysis, Preliminary Report, Pub. Health Rep. **45**: 1703 (July 25) 1930. Bennett, C. R.: Group of Patients Suffering from Paralysis Due to Drinking Jamaica Ginger, South. M. J. **23**: 371 (May) 1930. Harris, Seale, Jr.: Jamaica Ginger Paralysis (Peripheral Polyneuritis), South. M. J. **23**: 375 (May) 1930. Burley, B. T.: The 1930 Type of Polyneuritis, New England J. Med. **202**: 1139 (June 12) 1930. Merritt, H. H., and Moore, M.: Peripheral Neuritis Associated with Ginger Extract Ingestion, New England J. Med. **203**: 4 (July 3) 1930.

almost the same characteristics. The cases of jamaica ginger paralysis show more extensive weakness, more intense and widespread atrophy, and more markedly affected tendon reflexes. Our case resembled strikingly the jamaica ginger type of paralysis.

The pathogenesis of triorthocresyl neuritis would appear to depend on the selective action of the toxic substance on myelin sheaths of the peripheral nerves with secondary degeneration of the axis cylinders (periaxillar neuritis). This was shown experimentally especially on chickens by ter Braak and Carrillo [4] and by Smith and Lillie [14] and in the clinicopathologic investigations in jamaica ginger paralysis by Jeter,[15] Turley [16] and Goodale and Humphreys.[17] In addition to the peripheral nerves of the extremities, triorthocresyl is reported to have caused retrobulbar neuritis.[18]

131 State Street — 1832 Spruce Street.

Clinical Notes, Suggestions and New Instruments

A SIMPLIFIED APPARATUS FOR THE APPLICATION OF SUCTION AND PRESSURE TO THE LOWER EXTREMITIES IN PERIPHERAL VASCULAR DISEASE

JAMES J. SHORT, M.D., NEW YORK
Assistant Clinical Professor of Medicine, New York Post-Graduate Medical School of Columbia University

Vascular disease of the lower extremities, sufficient to cause symptoms of impaired circulation, is in the majority of cases of the arteriosclerotic type; such cases outnumber many times those presenting vascular spasm. Whereas symptoms due to vascular spasm can often be promptly alleviated by measures undertaken to relax the spasm, those having organic occlusion respond little to such measures, and results are usually discouraging.

One selected small group of arteriosclerotic cases presenting such changes as intermittent claudication, trophic lesions and other physical signs of organic occlusion were systematically treated over varying intervals of from three to six months by such measures as hyperthermia induced by the intravenous injection of typhoid vaccine, by Buerger's exercises, alternate hot and cold applications, the systematic use of a tourniquet to induce passive hyperemia, the hypodermic injection of acetylcholine, the intravenous injection of calcium gluconate and the oral administration of iodides, sodium salicylate, calcium lactate and theobromine. Differentiation between spasm and organic occlusion was made on the basis of history, general physical examination and vasodilator response to nerve block or the application of heat.[1] It was my experience that the patients in this group were mostly unimproved at the end of several months of systematic treatment.

The work of Landis and Gibbon [2] on the effects of alternate suction and pressure on blood flow in the lower extremities seemed to indicate that this method had greater promise of definite benefits than any method heretofore in use. An apparatus was therefore constructed, based on their suggestions. Many details are shown in the accompanying illustrations. A rotary pump with a capacity of 10 cubic feet per minute, driven by an electric motor of one-fourth horse power, is connected with a chamber of sheet metal 76 cm. long, 28 cm. square at the open end and 28 cm. by 34 cm. at the closed end. To the margins of a round opening 15 cm. in diameter, through semiflexible rubber of 1 inch thickness used to close the smaller end of the chamber, is vulcanized a pneumatic rubber cuff similar to that

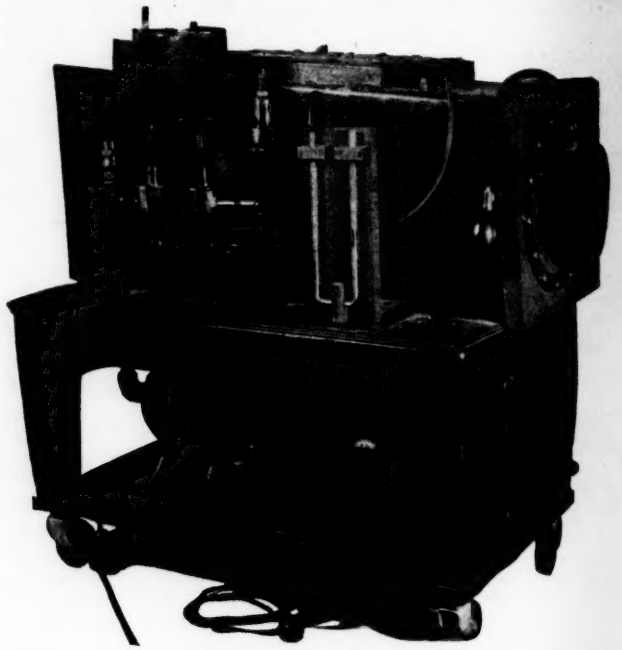


Fig. 1—Appearance of simplified apparatus for application of suction and pressure to the lower extremities in peripheral vascular disease.

used with sphygmomanometers. This is 6 inches in length and tapers to approximate the thigh. Its outer wall is fairly heavy; its inner wall lighter and more flexible. Air is introduced into the cuff through a pressure bulb and is regulated so as to exert the minimal pressure necessary to seal the juncture with the thigh. This new design has obviated previous difficulties with leaks due chiefly to variation in the size of thighs.

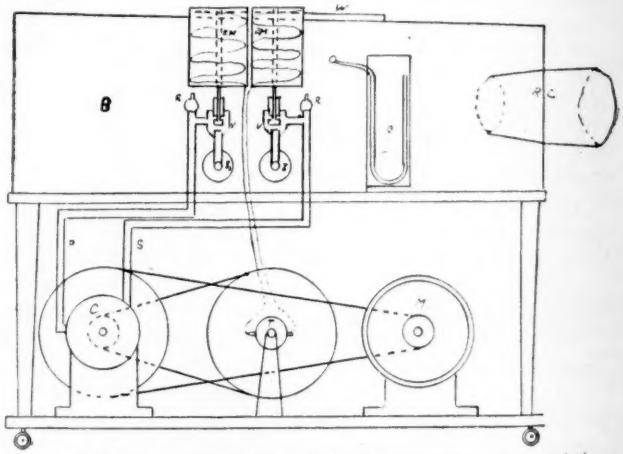


Fig. 2.—Diagram of apparatus. *EM*, electromagnets; *R*, regulating valves; *G*, mercury gage; *B*, box; I_1, inlet to box; *I*, outlet; *P*, pressure pipe; *S*, suction; *C*, compressor; *T*, timer for *EM*; *M*, motor; *RC*, rubber cuff; *W*, Wiev glass.

Following Landis's suggestions as to optimal periods, a negative pressure is produced within the chamber for twenty-five seconds, followed by a positive pressure for five seconds. Thus far pressures of from 110 to 120 mm. negative and from 80 to 110 positive have been used. A rapid reversal of air current is obtained through the use of valves operated by electromagnets, as noted in figure 2. The electromagnets are activated from a switch on a cam driven through a reducing gear from the

14. Smith, M. I., and Lillie, R. D.: Histopathology of Triorthocresyl Phosphate Poisoning: Etiology of So-Called Ginger Paralysis, Arch. Neurol. & Psychiat. **26**: 976 (Nov.) 1931.
15. Jeter, Hugh: Autopsy Report of a Case of So-Called Jake Paralysis, J. A. M. A. **95**: 112 (July 12) 1930.
16. Turley, L. A.: Neuropathology Found in Cases of "Jake" Paralysis, J. Oklahoma M. A. **23**: 193 (June) 1930.
17. Goodale, R. H., and Humphreys, Margaret B.: Jamaica Ginger Paralysis: Autopsy Observation, J. A. M. A. **96**: 14 (Jan. 3) 1931.
18. Juhász-Schäffer, A.: Retrobulbar Neuritis Resulting from Use of Apiol as abortifacient, Klin. Monatsbl. f. Augenh. **89**: 361 (Sept.) 1932; abstr. Klin. Wchnschr. **11**: 1232 (July 16) 1932.

Read before the New York Surgical Society, March 27, 1935.
From the Medical Department of the New York Post-Graduate Hospital.

1. Gibbon, J. H., Jr., and Landis, E. M.: Vasodilatation in the Lower Extremities in Response to Immersing the Forearms in Warm Water, J. Clin. Investigation **11**: 1019 (Sept.) 1932.
2. Landis, E. M., and Gibbon, J. H., Jr.: The Effects of Alternate Suction and Pressure on Blood Flow to the Lower Extremities, J. Clin. Investigation **12**: 925 (Sept.) 1933.

pump. The motor and pump operate continuously throughout the treatment, the pressure within the apparatus being maintained at the desired height through the use of relief valves, which in turn can be regulated to produce any pressure within the apparatus that may be desired.

The design of the apparatus differs mechanically from that of Landis and Gibbon in several respects: (*a*) Relief valves are used, which can be regulated to produce any pressures desired; (*b*) the pump operates continuously; (*c*) the use of adhesive plaster with the cuff is eliminated and a regulated pneumatic pressure is applied; (*d*) alternation from negative to positive pressure is produced directly from a single motor by means of electromagnets operating a valve system rather than by a second motor to rotate the four-way valve as described by them; (*e*) duration of the periods of negative and positive pressures can be readily changed by adjusting the cam.

Results of treatment thus far have been encouraging. Further experience is necessary, however, to evaluate conclusively this method of therapy.

580 Park Avenue.

A LABORATORY TEST OF "HOXIN" AS A CLAIMED CANCER "CURE"

C. C. LITTLE, SCD., AND A. M. CLOUDMAN, PH.D.,
BAR HARBOR, MAINE

One of the difficulties in connection with various claims that substances which are cures for cancer have been discovered is to obtain an adequate experimental test of these substances on cancer in laboratory animals.

This brief communication records such tests of a substance called "Hoxin," advanced by Mr. Harry Hoxey of Philadelphia as a cure for cancer. This substance is used for treatment in two forms: (*a*) as a solution administered orally for internal cancer; (*b*) as a powder placed directly in contact with external cancer.

The laboratory material used consisted of mice inoculated with a malignant tumor, No. 15091a, reported on by Cloudman.[1]

INTERNAL TREATMENT

EXPERIMENT 1.—Thirty mice were inoculated subcutaneously with tumor 15091a, Nov. 13, 1934. Beginning on the same day they were given, as the sole liquid element in their diet, a solution of "Hoxin" designated as of "X" strength. On the sixth day (November 18) this strength was doubled to "2X." These mice all died of cancer.

Controls consisted of twenty mice similarly inoculated but whose liquid diet was tap water. These mice also all died of cancer.

EXPERIMENT 2.—Nov. 30, 1934, fifteen mice were placed on a diet the liquid element of which was a "full strength" (8X) solution of "Hoxin." On the following day they were inoculated with tumor 15091a. The tumor grew progressively in all of them. They all showed healthy growing tumors at death. These animals were weighed before the treatment began. Under it they lost weight rapidly and showed generally a very poor physiologic response.

Controls consisted of five mice whose liquid diet was tap water. Otherwise treatment was the same. These mice lost no weight but also died with actively growing tumors present.

EXPERIMENT 3.—Nine mice were kept for three weeks on a diet the sole liquid element of which was a 6X solution of "Hoxin." They were then inoculated with tumor 15091a. They all grew the tumor rapidly and died of it.

The obvious conclusion is that internal treatment with "Hoxin" has no preventive or curative effect on mice inoculated with tumor 15091a.

EXTERNAL TREATMENT

EXPERIMENT 4.—Ten mice were inoculated with tumor 15091a, Nov. 13, 1934. November 21 they showed palpable masses. Under pentobarbital sodium the skin over the tumor was cut and a small incision was made in the tumor mass. On this incision an amount of powder "sufficient to cure a human epithelioma" was placed. These mice all died of cancer. A violent reaction to the powder was obtained. Hard lumps apparently necrotic and inflammatory were observed near and around the tumor, and selective elimination of tumor cells was not apparent.

Ten controls treated in exactly the same way except for the powder showed no such reaction but died of cancer.

EXPERIMENT 5.—Ten mice were inoculated with tumor 15091a November 13 and on November 22 had their tumor masses treated as in experiment 4. At death they all had healthy growing tumors.

EXPERIMENT 6.—Ten mice were inoculated with tumor 15091a, Nov. 13, 1934, and (without pentobarbital sodium) were treated with powder, November 23. At death, all showed healthy growing tumors. In several of these mice, marked corrosion and destruction of normal tissue was noted. In one (mouse 6) the destruction of normal tissue had extended through the walls of the pericardial cavity and peritoneum and had affected the surface of the liver, causing adhesions.

No such destruction of normal tissue and no inflammation or necrosis were noted in the controls.

The conclusion is that direct application of powdered "Hoxin" does not "cure" mice inoculated with tumor 15091a.

In addition, there is no sign of selective action for tumor tissue, and actual destruction of normal tissue may be extensive.

From the Roscoe B. Jackson Memorial Laboratory.

1. Cloudman, A. M.: Am. J. Cancer **16**: 568-630 (May) 1932.

Special Article

GLANDULAR PHYSIOLOGY AND THERAPY

THE THERAPEUTIC USE OF ESTROGENIC SUBSTANCES

EMIL NOVAK, M.D.
BALTIMORE

NOTE.—*This article and the articles in the previous issues of* THE JOURNAL *are part of a series published under the auspices of the Council on Pharmacy and Chemistry. Other articles will appear in succeeding issues. When completed, the series will be published in book form.*—ED.

Estrogenic substances are those which produce estrus directly. There are other substances, notably the gonadotropic principles of the anterior pituitary lobe, that can produce estrus indirectly through their activating effect on the ovarian follicles. The present article deals with the therapeutic applications of estrogenic substance itself. This name is chosen as a generic term, in preference to the others commonly employed, to avoid possibly misleading implications as to chemical constitution, source or function and to emphasize that such principles produce estrus, and not menstruation, which is a very different thing.

It would be out of the question to attempt a collective review of the vast literature of the subject within the limits of a short paper, so that this article is offered rather as a summary of conclusions and impressions gained from a fairly extensive survey of the literature and a reasonably large clinical experience. For an excellent summary of the literature on estrogenic substances, the reader may be referred to the special article published by the Council on Pharmacy and Chemistry.[1]

In spite of the remarkable advances made in reproductive physiology, there is still much confusion on many points, even among scientific investigators, so that

1. Estrogenic Substances: Theelin, report of the Council on Pharmacy and Chemistry, J. A. M. A. **100**: 1331-1338 (April 29) 1933.

it is not surprising that the therapeutic application of these new advances is anything but clearly defined. Every one feels that gynecologic organotherapy is, on the whole, extremely disappointing, and yet the feeling is universal that it is in this direction that one must look for improvement in methods of treating the functional gynecologic disorders. Adding to this the great frequency of these disorders, and the fact that no other satisfactory treatment is known, it becomes easy to understand why the harassed clinician will continue to employ endocrine therapy in spite of its questionable value for many indications. To paraphrase a popular automobile slogan, When better methods are found, the clinician will use them.

In the meantime it behooves the clinician to make his organotherapy as rational as possible, and this can be done only by familiarizing himself with at least the elements of reproductive physiology and endocrinology. It seems unavoidable to include in this paper a discussion of some forms of treatment which are admittedly unsatisfactory and inadequate but which the clinician, without loss of dignity and self respect, will often use for the simple reason that they are for the present the best available to him.

PHYSIOLOGIC BASIS FOR ESTROGENIC THERAPY

While the physiology of estrogenic substance is considered in other articles of this series, it seems advisable to set forth, in epitomizing fashion, the major premises on which this discussion of therapeutic applications is based:

1. Estrogenic substance is an active principle of the growing ovarian follicle, although found in many other body tissues and fluids, such as the placenta, the amniotic fluid, and the urine of pregnant women.

2. The physiologic effect of estrogenic substance on the endometrium is to produce growth and hyperemia but not secretory activity.

3. The corpus luteum formed after rupture of the follicle (usually about the middle of the intermenstrual interval) continues, in the human being at least, to secrete estrogenic substance, but in addition produces another hormone, "progestin," to which is due the secretory activity of the endometrial gland epithelium so characteristic of the premenstrual or prenidatory phase of the cycle.

4. The actual bleeding of menstruation, according to the weight of present evidence, is brought about by an abrupt withdrawal of estrogenic substance, bringing about partial destruction and desquamation of the endometrium, with resulting hemorrhage.

5. Certain nonmenstrual types of bleeding may be produced by similar drops in the blood level of estrogenic substance.

6. Both follicle ripening and the secretion of estrogenic substance, on the one hand, and luteinization and the production of progestin, on the other, are due to the influence of the gonadotropic hormones of the anterior hypophysis.

7. There is practical unanimity among investigators that estrogenic substance is not a stimulant of ovarian activity; the evidence indicates that sufficiently large or prolonged dosage inhibits ovarian activity, because of the depressing effect of estrogenic substance on the secretion of the anterior pituitary gonadotropic hormones.

8. While there is some difference of opinion on this point, the work of the great majority of the best investigators indicates that estrogenic substance is responsible for the normal rhythmic contractility of the uterine musculature and that progestin is an inhibitor of this property.

PREPARATIONS AVAILABLE

It seems impossible to avoid the use of trade names in the discussion of the estrogenic substances available for clinical use. Indeed, unless this is done, this article might mean very little to the average reader. The better manufacturers appear to be making an honest effort to supply the profession with substances of genuine estrogenic potency, and their laboratories have shown a commendable willingness to cooperate both with clinicians and with laboratory workers in the investigation of the many problems of gynecologic endocrinology. That their ultimate purpose is commercial need not necessarily be considered an objection, though it naturally explains the uncritical attitude sometimes shown in their interpretation of clinical results.

None of the estrogenic preparations have as yet been accepted by the Council on Pharmacy and Chemistry, although their use in clinical practice is widespread. For the present, the safest course for the practitioner is to employ only preparations made by manufacturers of recognized standing. Because most of the estrogenic material employed in this country is made by two large American manufacturers and one German firm, it seems worth while to enumerate the preparations made by these, as they are representative of general types. No attempt can be made to pass judgment on the comparative potency or therapeutic efficacy of these preparations, nor is there any implication that any of them is superior to products made by other American or foreign firms. On the other hand, the notorious general unreliability of certain manufacturers of organ extracts would seem a safe indication as to the probable unreliability of the estrogenic substances which they manufacture.

Preparations for Oral Administration.—Of the older forms of whole ovarian substance, ovarian residue and corpus luteum extracts, little need be said. They are now commonly accepted as being inert or almost inert, containing little or none of the active hormones, with the further disadvantage that even this little is largely nullified by the digestive juices.[2] There would seem to be no reason for their employment at the present day, when preparations of demonstrated laboratory potency are readily available. The following preparations of the estrogenic substances are the ones most widely employed in this country:

Theelol (P. D. & Co.), a trihydroxy derivative of theelin, marketed in capsules of 50 rat units each.

Amniotin (Squibb) in gelatin capsules each containing 1,000 international units.

Progynon (Schering), in tablets of 45 rat units. This product is claimed to be a placental extract, in which the estrogenic substance is not reduced to the crystalline state; it is said to contain, in addition, certain placental lipoids.

Preparations for Hypodermic Administration.—These are as follows:

Theelin (P. D. & Co.), an aqueous solution of the crystalline theelin of Doisy, in 1 cc. ampules of 167 international units.

Theelin in oil (P. D. & Co.) in 1 cc. ampules with a potency of 1,000 international units.

2. Novak, Emil: Endocrinology **6**: 599-620 (Sept.) 1922.

Amniotin (Squibb), in 1 cc. ampules, each containing either 2,000 or 8,000 international units in corn oil.

Progynon (Schering) in 1 cc. ampules of 25 rat units of estrogenic substance in aqueous solution.

Progynon B (Schering), in 1 cc. ampules, of 10,000 or 50,000 international units of hydroxyestrin benzoate in sesame oil.

Unit of Dosage.—The unit of dosage commonly employed in this country is the Allen-Doisy rat unit, defined as the quantity of active principle, divided and given in three injections at four hour intervals, necessary to induce estrus within three days, as judged by the presence of cornified cells in vaginal smears, in ovariectomized sexually mature rats of a standard weight (140 ± 20 Gm.). The international unit, now coming into use, is that dosage necessary to produce an effect, under identical conditions, equal to that of 0.1 microgram (0.0000001 Gm.) of a standard preparation of crystalline theelin. According to the report issued by the League of Nations [2a] the international unit is about one-third the Allen-Doisy rat unit.[2b]

ROUTES OF ADMINISTRATION

From the point of view of the patient, the most convenient plan of estrogenic therapy is undoubtedly the oral. It should be remembered, however, that the digestive juices apparently have a destructive effect on estrogenic substance and that approximately five times the effective hypodermic dosage must be used when the substance is administered orally. As estrogenic products are quite expensive, the hypodermic route will often be chosen, especially in view of the greater precision as to the dosage absorbed by the patient.

For long continued use, and especially when smaller amounts are necessary, the oral route possesses many advantages. This is especially true in the treatment of the menopausal symptoms.

As the estrogenic substances are absorbed through the vaginal mucous membrane, they are sometimes administered by vaginal suppositories. There is always much uncertainty, however, as to the amount actually absorbed, especially as the suppositories are not infrequently lost from the vagina. Because of this and because of the disagreeableness of this method to many women, it has not achieved any great vogue. Nor has the nasal spray method, suggested by Pratt and Smeltzer.[3] Furthermore, with the increasing development of oral therapy, there would seem to be no advantage in either the vaginal or the nasal method.

INDICATIONS

Amenorrhea.—While the treatment of amenorrhea by estrogenic substances is notoriously unsatisfactory, it is in this condition, perhaps more often than any other, that they are employed, so that a fairly full discussion of this subject may not be omitted from this paper. The limitations of estrogenic substance in the relief of amenorrhea are at once apparent if one will bear in mind that although such products are certainly capable of producing estrus in animals, the latter phenomenon is very different from menstruation in women. No amount of estrogenic substance can produce in the endometrium the sequence of histologic changes characterizing the menstrual cycle, for always the secretory phenomena dependent on the presence of progestin are lacking. It has been suggested that in some cases the giving of large amounts of estrogenic substance may build up the endometrium so that in spite of existing deficiency of the corpus luteum hormone (progestin) the histologic cycle, with the culminating premenstrual secretory phase, may be completed. There is, however, no scientific evidence for this, and clinical results make it questionable.

The second important shortcoming in estrogenic therapy of amenorrhea is the fact, already emphasized, that there is no activating effect on the ovary itself, so that such therapy is purely substitutional and applies to one particular cycle, with no reason to expect reestablishment of the regular menstrual rhythm.[4] Here again it has been stated by some that theelin may stimulate the anterior hypophysis and thus activate the ovarian function, but the weight of available evidence is exactly to the contrary.

In the treatment of amenorrhea, it must be remembered that this disorder may be a symptom of many possible underlying conditions, usually constitutional, occasionally local. A very complete investigation is necessary before one can arrive even at an intelligent surmise as to the mechanism involved. The correction of a causative constitutional factor, when this can be found, makes unnecessary any direct organotherapy of the amenorrhea. In other cases, notably those of thyroid origin, the administration of thyroid may be all that is necessary. Speaking generally, the primary form of amenorrhea is much more intractable to treatment than is the secondary.

Aside from the hypothyroid group, the two types in which direct ovarian organotherapy is most often employed are the hypogonadal and hypopituitary, the assumption being that in the first the secretory defect involves the ovaries, while in the second it is the activating function of the anterior lobe which is at fault. In some cases clinical evidence makes such diagnoses plausible, in others blood and urine hormone studies seem to justify them.

With reference to the wisdom of qualitative and quantitative hormone studies when practicable there would seem to be no doubt, although as yet they have added very little to therapeutic success. The value of a single blood hormone determination is very doubtful, and the rather large amounts of blood necessary for the tests make their frequent repetition impracticable, as Neumann [5] and others have emphasized. The interpretation of the results of urine hormone study is often difficult, because of uncertainties as to the factors governing the renal excretion of the hormones and also ignorance of whether the excreted hormones represent a real excess or whether they have already fulfiled a function in the body. There is no doubt that the excellent studies now being prosecuted on blood and urine hormonology in many clinics will yield valuable results, but those thus far obtained would not seem to justify

2a. League of Nations: Conference on the Standardisation of Sex Hormones, Quarterly Bulletin of the Health Organisation, Special Number, January 1935, p. 121.

2b. In comparing the potencies of the various commercial preparations and in calculating dosage it should be kept in mind that the different firms employ different ratios for the comparative potencies of the rat unit and international unit. Thus, Parke Davis and Company considers the rat unit to be about 3.3 times as large as the international unit; the Schering Corporation indicates that one rat unit is equivalent to five international units, while E. R. Squibb and Sons considers the rat unit to be eight times the international unit. For a discussion of assay methods the reader is referred to the report of the Council on Pharmacy and Chemistry [1] and to the report of the League of Nations.[2a]—ED.

3. Pratt, J. P., and Smeltzer, M.: Endocrinology **13**: 320-326 (July-Aug.) 1929.

4. Novak, Emil: Brit. M. J. **2**: 553-557 (Sept. 23) 1933; Am. J. Obst. & Gynec. **24**: 319-329 (Sept.) 1932.

5. Neumann, H. O.: Zentralbl. f. Gynäk. **56**: 391-394 (Feb. 13) 1932.

insistence on such studies in all cases encountered by the clinicians for whom this article is chiefly intended. In the recent paper by Frank and his associates[6] "emphasis is placed on the accurate size up of the individual studied and on other laboratory aids which help in the recognition and evaluation of congenital and acquired endocrine stigmas." This paper may be referred to as an excellent summary of the hormonology of the menstrual disorders.

So far the comments on the ovarian therapy of amenorrhea have been entirely adverse, and perhaps not a great deal would be lost if the discussion stopped at this point. And yet the harassed clinician is always insistent on some plan of procedure in the management of amenorrhea, especially as the amenorrheic patient is herself so worried about her condition and so anxious for its correction. This is particularly true because of the prevalent belief of the public that menstruation is essential to health and well being, and that absence of the function, with its supposed retention of harmful substances in the system, may bring about serious results.

After a thorough study of the patient in an effort to determine the cause of the symptom, one of the greatest services the physician can render is to impress on the patient the essential harmlessness of the amenorrhea per se and to explain to her in the simplest possible fashion the real meaning of menstruation, emphasizing especially that its purpose is not to rid the body of harmful substances. In many patients, especially those approaching the middle period of life or those in whom sterility is not a complicating problem, nothing more is necessary.

When, for one reason or another, treatment is called for, there can be no objection to efforts at ovarian therapy, so long as one appreciates its limitations. The administration of the estrogenic principles alone may at times be followed by bleeding, though a closer simulation of the normal hormone sequence would be obtainable by following the estrogenic substance with the corpus luteum hormone. The latter is not yet available commercially, though in a number of reported cases a typical menstrual period, with its typical sequence of proliferative and secretory changes in the endometrium, was produced by this combined therapy in women who had been castrated a number of years previously.[7] Enormous dosages, however, were necessary. In Kaufmann's case, for example, 320,000 mouse units (about 65,000 rat units) of the estrogenic principle, followed by 90 rabbit units of progestin, was required, while in the other reported observations similarly huge doses were found necessary.

These studies would indicate that the usual therapeutic doses of estrogenic substance are ridiculously small, for ordinarily not more than 100 units daily for perhaps from six to twelve days (by the hypodermic route) has been employed. Even this dosage is expensive for the patient, while amounts of estrogenic substance that might fairly be considered adequate would be prohibitive to all except a few patients. One of the existing problems of American manufacturers is to produce these estrogenic principles at a very much lower cost, perhaps comparable to their low cost in Germany, and it is encouraging to learn that there is a prospect of improvement along this line in the near future.

Another difficulty lies in the present unavailability of progestin, which is found only in corpora lutea, a large amount of which is required to produce a small amount of the active principle. For the present the nearest approach to progestin for clinical purposes—though admittedly an unsatisfactory one—is the so-called anterior pituitary-like gonadotropic hormone of the urine of pregnant women (sometimes designated prolan). This substance has been discussed more fully in another article of this series. Suffice it to say here that some clinicians advocate the administration of this substance immediately following the completion of the course of estrogenic substance already suggested, an average dosage by the intramuscular route being 150 or 200 rat units daily for five or six injections. Others administer the two substances synchronously. As the anterior hypophysis is unquestionably the activator of the ovary, the hope for the intelligent treatment of amenorrhea is in the development of a really gonadotropic preparation for clinical use. The evidence indicates that the present day anterior pituitary-like preparations do not fill the bill.

Many clinicians prefer to use estrogenic substance by the oral route, though it should be remembered that the effective dose by mouth is about five times the hypodermic dose. If the cost of production of the estrogenic principles can be very materially lessened, the oral route will probably become the popular one. For amenorrhea, however, in which the object should be to give the patient the benefit of the largest dose possible at the lowest possible cost, the hypodermic route has definite advantages in spite of certain rather obvious objections. A combination of the oral and hypodermic methods is often employed.

This general plan of treatment is offered very unenthusiastically, because it will usually be unsuccessful. There are, of course, a considerable number of reports in the literature as to the success of ovarian therapy, but the dispassionate reader will immediately recognize that most of these are highly uncritical. In many reports, for example, the statement is made that estrogenic treatment was followed by bleeding, with no comment on whether there was periodic recurrence of the bleeding. In the minority of cases in which such recurrence is reported, it is difficult to explain this on the basis of any known physiologic facts, especially as the ovary itself is not stimulated by the estrogenic substance.

To say that it is impossible for estrogenic substance in any dosage ever to reestablish menstruation would be an extreme statement, in view of ignorance as to the hormone mechanisms involved. Such an occurrence, however, is so rare that the factor of coincidence cannot be eliminated, and the "post hoc, propter hoc" sequence cannot be assumed. If these remarks appear unduly pessimistic, I can say only that I know of no gynecologist of standing who is not unenthusiastic about the treatment of amenorrhea by estrogenic substances. On the other hand, I know of few who do not often resort to organotherapy for amenorrhea because they know of no treatment that offers any more prospect of success.

Frank and his associates[6] cite a number of cases in which spontaneous reestablishment of the menstrual

6. Frank, R. T.; Goldberger, M. A., and Spielman, Frank: Present Endocrine Diagnosis and Therapy, J. A. M. A. **103**: 393-402 (Aug. 11) 1934.

7. Clauberg, C.: Zentralbl. f. Gynäk. **57**: 1461-1468 (June 24) 1933. Kaufmann, C., ibid. **57**: 42-46 (Jan. 7) 1933.

function occurred, suggesting that many supposedly successful therapeutic results are explainable on this basis. While this is unquestionably true, my observation has been that in the usual type of endocrinopathic amenorrhea of long duration spontaneous reestablishment of the function is uncommon, so that the unwillingness of both physician and clinician to hang to this hope is understandable and justifiable. As with certain types of almost hopeless cancer, he will do the best he can with the admittedly unsatisfactory methods available to him. If a sly dig is permissible, reference may be made to the "Queries and Minor Notes" columns of the erudite JOURNAL, in which so frequently advice is sought as to the treatment of endocrinopathic amenorrhea. I do not recall an instance in which the answer omitted suggestions as to organotherapy, though always with a fair statement of its limitations and inadequacy.

Functional Uterine Bleeding.—While the estrogenic substances have been used by some gynecologists in the treatment of functional bleedings, and while this plan is recommended in the literature of some manufacturers, it does not seem logical. In general, this menstrual disorder is due to a relative increase in estrogenic substance and a corresponding absence of progestin, though it is true that the actual bleeding may well be due to periodic drops in follicular secretion, because of the reciprocal effects of the latter on the anterior hypophysis. However, it would scarcely seem possible to ward off the drop indefinitely by supplying estrogenic substance artificially. Furthermore, a much more frequently successful plan in the management of such cases is available in the administration of the anterior pituitary-like gonadotropic hormones derived from the urine of pregnant women (antuitrin S or follutein), as suggested by Novak and Hurd.[8] This subject is considered more fully in another article of this series.

Menopausal Vasomotor Symptoms.—This indication for the employment of estrogenic substances appears to have achieved much more widespread acceptance than any other. It should, first of all, be emphasized that the majority of menopausal women need no organotherapy whatever, for either the symptoms are very slight or they are controllable by such simple measures as reassurance, insistence on the avoidance of physical or mental stress or worry, and perhaps the use of such simple nerve sedatives as the bromides. In a minority of cases, however, and not infrequently also in the artificial menopause, produced by radium therapy or operation, the symptoms may be so distressing as to call for efforts at relief.

While such plans of treatment as hypophyseal irradiation are advocated by some, organotherapy is certainly the first thought of almost all practitioners. There is a considerable measure of rationale in the plan. For example, it has been shown by hormone studies that in at least some phases of the menopause a diminution in secretion of estrogenic substance occurs (Zondek[9]), and it is in this phase that the characteristic vasomotor symptoms are apparently most pronounced. Again, the removal of granulosa cell ovarian tumors which produce large amounts of estrogenic factor, and only this substance, is apt to be followed by characteristic menopausal symptoms, even in old women who had already experienced a normal menopause many years previously (Novak, Schulze, Dworzak).

It is scarcely necessary to stress the difficulty in the interpretation of subjective symptoms or of eliminating the ever-possible psychic factor. A measure of objective evidence is available, however, in the number of the vasomotor flushes that constitute the most characteristic menopausal symptom, and there would seem little doubt that therapy with estrogenic substance is of real, though very variable and inconstant value for this group of symptoms. It is only fair to state, however, that some excellent gynecologists have little confidence in any endocrine treatment of the menopausal symptoms. I do not share the extreme pessimism expressed in this regard in the recent paper of Frank, Goldberger and Spielman.[6]

Many plans of carrying out the treatment have been employed. As the required dosage is apparently not large, the oral route is more frequently applicable here than with certain other indications, though in severe cases the hypodermic method is probably more efficacious. Severinghaus[10] has recently made a study of the comparative efficacy of the various routes of administration of estrogenic substance and finds both the hypodermic and the oral methods successful, although the latter requires five times the dosage of the former.

When the menopausal symptoms are not very severe, one of the oral preparations (theelol, amniotin oral, progynon) will probably be the method of choice, the dosage averaging from 100 to 200 rat units a day. When the vasomotor flushes come thick and fast, more striking results are obtained from the daily injection of 50 rat units of one of the aqueous or oily solutions.[2b] Such medication is not necessarily expensive to the patient, because the organotherapy need usually be resorted to only from time to time, when the severity of the symptoms seems to necessitate it.

Gonorrheal Vaginitis in Children.—An interesting therapeutic application of biologic knowledge has recently been suggested in the management of this, one of the bugbears of gynecologic practice. It has long been known that estrogenic substance is capable of producing very pronounced proliferation of the vaginal epithelium in immature laboratory animals, with desquamation after discontinuance of the injections. In view of this fact, the suggestion was made by Lewis[11] that the estrogenic preparations might prove of value in the treatment of gonorrheal vaginitis in children, and this was apparently borne out in the cases in which the method was tried. Since then, favorable results have been reported by Brown,[12] Huberman and Israeloff,[13] and others, although the method is too new to warrant sharply defined opinions.

That proliferation of the vaginal mucosa can be produced in children by this method permits of no doubt, the two chief questions now being (1) the rapidity and permanence with which the gonococcus can be made to disappear, and (2) the possibility of any injurious by-effects. With reference to the latter, the objection

8. Novak, Emil, and Hurd, G. B.: Am. J. Obst. & Gynec **22**: 501-512 (Oct.) 1931.
9. Zondek, Bernhard: Die Hormone des Ovariums und des Hypophysenvorderlappens, Berlin, Julius Springer, 1931.
10. Severinghaus, E. L.: The Relief of Menopause Symptoms by Estrogenic Preparations, J. A. M. A. **104**: 624 (Feb. 23) 1935.
11. Lewis, R. M.: Am. J. Obst. & Gynec. **26**: 593-599 (Oct.) 1933.
12. Brown, Joseph: Treatment of Gonorrheal Vaginitis in Immature Girls, J. A. M. A. **102**: 1293-1294 (April 21) 1934.
13. Huberman, John, and Israeloff, H. H.: Therapeutic Value and Effects of Amniotin in Gonorrheal Vaginitis in Children, J. A. M. A. **103**: 18-21 (July 7) 1934.

has been raised that the injection of estrogenic substance might produce harmful effects on the child's ovary, through the medium of the anterior hypophysis, though this seems unlikely with the recommended dosage. Experimental studies have shown a rather rapid restitution of ovarian function in animals even when large and prolonged dosage had brought about extreme ovarian impairment (Hisaw et al.).

The fear that the pelvic hyperemia produced by estrogenic substance may predispose to uterine and tubal pelvic extension of the vaginal infection is probably more apparent than real, though only time and the continued employment of this plan of treatment can decide this point. Enlargement of the breasts may occasionally be noted during the treatment, but this is transitory. So far as I know, vaginal bleeding has not been observed, though theoretically one might expect it to occur occasionally after the cessation of the injections.

The great advantage claimed for the method is the rapid disappearance of the infecting organisms, so resistant to all other known methods of treatment. Of his seven patients, Brown [12] states that four showed negative smears at the end of ten days, while six were negative at the end of twenty days and all seven at the end of thirty days. The method is now being tried out on a large scale in several clinics, and it should not be long before the results of such studies will permit of a more accurate evaluation than is now possible.

For the present it can be said that the method is one of great promise, that its employment in the treatment of the gonorrheal vaginitis of children is proper, but that it should be combined with careful bacteriologic study, in order to check on the rapidity of disappearance of gonococci and especially to determine whether or not the patient may escape the relapses so characteristic of this disease.

The dosage recommended by Lewis is 50 rat units hypodermically each day, the average total amount administered being 2,100 units. The duration of treatment in his cases averaged twenty-one days. Local treatment is not used.

Hemophilia.—In 1931, and in papers since then, Birch [14] has advocated the use of ovarian extracts in the treatment of hemophilia, stating that estrogenic substance was found to be absent from the urine of a number of hemophiliac patients, though present in the urine of normal males. The beneficial results of the treatment, as reported by her, seemed rather surprising in that they were often obtained from the oral administration of ovarian preparations commonly believed to be almost inert. Theelin, an admittedly potent preparation, she found to be "not so good as whole ovary." A number of other authors reported similarly good results from the treatment.

A recent thorough study of the question by Brem and Leopold,[15] however, seems to discredit Birch's observations quite completely. They were not able to demonstrate the presence of the estrogenic hormone in the urine of normal males, and they urge that, if this substance really holds hemophilia in abeyance, it should be present in the urine of all normal males. Furthermore, in a case of hemophilia that they studied, they failed to observe any reduction in the coagulation time of the blood or any hemostatic effect from the use of an estrogenic substance of known potency. They look on the symptomatic treatment of hemophilia and the employment of blood transfusions as still the method of choice in the treatment of this disease.

Other Indications.—Dysmenorrhea has been treated with the estrogenic principles, either empirically or on the basis of Kennedy's [16] view that the symptom is due to degenerative changes in Frankenhauser's ganglion as a result of deficiency of estrogenic substance. This work, however, is unsupported by any confirmatory evidence, and there is, on the other hand, much evidence to indicate that this factor is the normal stimulant of uterine contractility, so that its use in dysmenorrhea appears irrational. When there is an associated hypoplasia of the uterus, the use of estrogenic substances, because of their effects on the blood supply and development of the uterus, would seem proper. When such treatment is used, the substances should be given after menstruation and in the midinterval period rather than just before the expected date of a period.

Sterility is often an accompaniment of endocrinopathic amenorrhea, and its endocrine treatment is on an even more unsatisfactory scientific basis than that of the latter, so that it seems scarcely worth while to theorize on this subject in this short paper. Though it is possible that deficiency of follicular secretion may occasionally be the cause, treatment on this basis is in the nature of a "shot in the dark" and will rarely be successful. Even if pregnancy occurs, it is difficult to eliminate the factor of chance. The kraurosis of the vulva occasionally seen in women at the menopause is looked on as probably due to withdrawal of the follicular hormone, and ovarian therapy is resorted to by most gynecologists, but the results are rarely striking.

The condition of painful breasts or "mazoplasia" is said by Cutler [17] to be favorably influenced by the oral administration of ovarian residue, while Whitehouse [18] believes that the hypodermic use of estrogenic substance is to be preferred. Aside from uncertainty as to the rationale of these methods, it is hard to believe that any worth while benefit could come from the oral administration of ovarian residue, generally believed to be practically inert. That the ovarian hormones are responsible for the development of certain benign conditions of the breast seems unquestionable, in the light of such recent investigations as those of Lewis, Geschickter and Hartman, but excess of estrogenic substance appears to be most often the responsible factor, so that such therapy would seem illogical.

The Concept of "Antihormones."—The recent suggestion of Collip and his co-workers that the continued administration of various hormones excites the formation of antihormones, so that there is a diminution or loss of the characteristic response to these hormones, is one which must arrest the attention of everyone interested in endocrinology. In spite of the high standing of these investigators, it is only fair to state that judgment must be reserved until their results are con-

14. Birch, Carroll L.: Proc. Soc. Exper. Biol. & Med. **28:** 752 (April) 1931; Hemophilia and the Female Sex Hormone, J. A. M. A. **97:** 244 (July 25) 1931; Hemophilia, ibid. **99:** 1566 (Nov. 5) 1932.

15. Brem, Jacob, and Leopold, J. S.: Ovarian Therapy, J. A. M. A. **102:** 200-202 (Jan. 20) 1934.

16. Kennedy, W. P.: Brit. M. J. **1:** 746-748 (April 23) 1932.

17. Cutler, Max: The Cause of "Painful Breasts" and Treatment by Means of Ovarian Residue, J. A. M. A. **96:** 1201 (April 11) 1931; Relation of "Chronic Mastitis," Cysts and Papillomas to Cancer of the Breast, ibid. **99:** 2152 (Dec. 24) 1932.

18. Whitehouse, H. B.: Surg., Gynec. & Obst. **58:** 278-286 (Feb.) 1934.

firmed. Hisaw, another excellent investigator, in some as yet unpublished studies (personal communication), has observed somewhat similar results, but his investigations indicate that these, species-specific reactions are to be interpreted as antibody effects rather than as antihormone reactions.[19]

SUMMARY

Estrogenic therapy is of little value in the treatment of endocrinopathic amenorrhea, although in many of these it is often resorted to because of the lack of any other treatment which is any more rational or any more effective.

The weight of evidence indicates that in the treatment of menopausal symptoms, proper allowance being made for difficulties in the interpretation of the therapeutic results, the estrogenic substances are of real though variable value.

The treatment of gonorrheal vulvovaginitis in children by means of injections of estrogenic substance is a promising method, though much more experience with it is necessary before worth while conclusions can be drawn as to the rapidity and permanence of the bacteriologic cure, and the possible harmful by-effects of the method.

At present it seems that the treatment of hemophilia with estrogenic preparations will not live up to early expectations, though here again further experience with the plan must be awaited.

While estrogenic therapy is at times employed for various other indications, as enumerated in the paper, the rationale is usually poorly defined and the results are ordinarily disappointing.[20]

26 East Preston Street.

19. Further discussion of antihormones will be found in other articles of this series: H. M. Evans, J. A. M. A. **104:** 464 (Feb. 9) 1935; P. E. Smith, J. A. M. A. **104:** 548 (Feb. 16) 1935, and J. B. Collip, **104:** 827 (March 9), 916 (March 16) 1935.—ED.

20. Additional references. The following list is far from being exhaustive, containing only such papers as I have referred to in my article, together with a small number of references to other papers and the most important books dealing with the general subject.

Allen, Edgar: Sex and Internal Secretions, Baltimore, Williams & Wilkins Company, 1932.
Anspach, B. M., and Hoffman, J.: Am. J. Obst. & Gynec. **26:** 147-160 (Aug.) 1933.
Brown, R. L., and Albright, Fuller: New England J. Med. **209:** 630-632 (Sept. 28) 1933.
Campbell, A. D.: Canad. M. A. J. **27:** 347-352 (Oct.) 1932.
Clauberg, C.: Die weiblichen Sexualhormone in ihren Beziehungen zum Genitalkyklus und zum Hypophysenvorderlappen, Berlin, Julius Springer, 1933.
Engelbach, W.: Endocrine Medicine, Springfield, Ill., C. C. Thomas, 1933.
Fluhmann, C. F.: Am. J. Obst. & Gynec. **26:** 764-775 (Nov.) 1933 (collective review); Ann. Int. Med. **6:** 1212-1224 (March) 1933.
Frank, R. T.: The Female Sex Hormone, Springfield, Ill., C. C. Thomas, 1929.
Geist, S. H., and Spielman, Frank: Am. J. Obst. & Gynec. **23:** 697-701, 701-707 (Jan.) 1932.
Hamblen, E. C.: Virginia M. Monthly **60:** 286-290 (Aug.) 1933; **59:** 464-474 (Nov.) 1932; Endocrinology **15:** 184-194 (May-June) 1931.
Hartman, C. G.: Am. J. Obst. & Gynec. **27:** 564-569 (April) 1934.
Kaufmann, C.: Klin. Wchnschr. **12:** 1557-1562 (Oct. 7) 1933.
Keene, F. E., and Payne, R. L.: South. M. J. **27:** 108-113 (Feb.) 1934.
Kurzrok, Raphael: Endocrinology **16:** 366-368 (July-Aug.) 1932.
Leonard, S. L.; Meyer, R. K., and Hisaw, F. L.: Endocrinology **15:** 17-24 (Jan.-Feb.) 1931.
Mazer, C., and Goldstein, L.: Clinical Endocrinology of the Female, Philadelphia, W. B. Saunders Company, 1932.
Novak, Emil, and Reynolds, S. R. M.: The Cause of Primary Dysmenorrhea, J. A. M. A. **99:** 1466-1472 (Oct. 29) 1932.
Robson, J. M.: Recent Advances in Sex and Reproductive Physiology, Philadelphia, P. Blakiston's Son & Co., 1934.
Rock, J.: New England J. Med. **208:** 362-368 (Feb. 16) 1933; **210:** 1303-1310 (June 21) 1934.
Schröder, R.: Der mensuelle Genitalkyklus des Weibes und seine Störungen, Veit-Stoeckel Handb. d. Gynäk., vol. 1, 2d half, Munich, J. F. Bergmann, 1928.
Severinghaus, E. L., and Evans, J. S.: Am. J. M. Sc. **178:** 638-644 (Nov.) 1929.
Smith, G. V., and Rock, J.: Surg., Gynec. & Obst. **57:** 100-103 (July) 1933.
Werner, A. A., and Collier, W. D.: J. A. M. A. **101:** 1466-1472 (Nov. 4) 1933.

Therapeutics

THE THERAPY OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—*In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.*—ED.

THERAPY OF IRITIS (IRIDOCYCLITIS) AND OF CHOROIDITIS

OUTLINE BY DR. SANFORD R. GIFFORD

Inflammation of the uveal tract may involve chiefly the anterior segment of the eye (iridocyclitis) or the posterior segment (choroiditis). While the search for the cause and the systemic treatment are conducted along the same principles for the two conditions, the local measures indicated in iritis are of little value in choroiditis; i. e., when the anterior segment is not involved.

DIAGNOSIS

Differentiation between acute iritis and acute glaucoma (q. v.) is of the greatest importance, as the treatment of the one is diametrically opposite to the treatment of the other, so that an error in diagnosis may produce most serious results.

Characteristics of Acute Iritis and of Acute Glaucoma

	Acute Iritis	Acute Glaucoma
1. Pupil:	Of affected eye smaller Reaction sluggish Posterior synechiae	Semidilated or dilated Reaction absent
2. Anterior chamber:	Deep	Shallow
3. Tension:	Usually decreased	Greatly increased
4. Vision:	Slightly impaired	Greatly impaired
5. Pain:	Referred to eye and region of ophthalmic division of fifth nerve only	Much more severe and may spread to second and third divisions of the fifth nerve

TREATMENT

1. *Causal.*—As delay of a few days in instituting the proper treatment may mean permanent loss of vision, a thorough search for the cause should be undertaken promptly. If at all possible, one should make, on the day the patient is first seen, a blood Wassermann test, roentgen examination of the teeth and examination of the throat and the nose, and should take a sinus roentgenogram whenever the nasal examination indicates the latter. Syphilis (q. v.) is the cause of from 20 to 25 per cent of cases of acute iritis. Focal infection (q. v.) of the tonsils in children, and of the teeth and sinuses and the prostate in adults, is next in order. In chronic iritis, tuberculosis (q. v.) is responsible for from 10 to 40 per cent of cases.

In cases, therefore, in which syphilis and tuberculosis can be ruled out, attention must be concentrated on the finding of the focus of infection and its prompt eradication, if at all possible. Even though this may precipitate a temporary increase in the symptoms of

iritis, it is often followed by rapid and complete relief. When, in acute cases, removal of infected teeth or tonsils does not give relief within a few days, one must search further without loss of time. Retained infected dental roots or infected areas of bone in mouths from which all teeth are said to have been removed should be searched for. The focus may be found in the genito-urinary tract in the form of gonorrheal or non-gonorrheal infection, which should receive appropriate treatment. If not found elsewhere, the intestinal tract and its adnexa (gallbladder or appendix) may be suspected as the source of the infection. For the therapy of these various forms of focal sepsis, the sections dealing with these will have to be consulted.

Removal of the cause is of importance in the interest not only of cure but also of prevention of recurrences, which otherwise are only too common.

2. *Local Measures.*—These are indicated in iritis, not in choroiditis.

Atropine Ointment

℞	Atropine sulphate	0.20 Gm.
	Distilled water	1.00 cc.
	Hydrous wool fat	2.00 Gm.
	White petrolatum	7.00 Gm.

Mix with careful trituration and dispense in collapsible tube with eye tip.

Label: Apply to affected eye every eight hours.

(*a*) Mydriasis must be secured promptly in iritis and maintained until all symptoms of inflammation have disappeared, chiefly in order to prevent permanent posterior synechiae. In moderately severe cases, from 5 to 10 drops of a 1 per cent solution of Atropine Sulphate instilled every two to three hours and, as soon as maximal dilatation has been secured, three times daily suffice to produce this result. An ointment containing 2 per cent of the alkaloid might be preferable because of more continuous action in producing the desired effect. When the solution is used, absorption—which occurs through the cornea—is favored if the patient is recumbent and the lids are held open, so that the cornea is kept flooded. To avoid systemic poisoning, finger pressure should be maintained during this time on the lacrimal sac by the patient himself. The preliminary use of 2 per cent Cocaine Hydrochloride solution promotes the effect of the atropine as well as the patient's comfort. If this procedure does not succeed in producing mydriasis, one should not hesitate to make a single application of a small particle of the powdered alkaloid salt in the sac. If mydriasis is not secured promptly by these means, one must employ subconjunctival injection of 0.2 cc. above and below the limbus of a mixture of 2 per cent Atropine Sulphate 1 part, and Solution of Epinephrine 2 parts, following the application of 2 per cent Cocaine Hydrochloride solution.

The mydriasis should be continued for at least two weeks after all symptoms have disappeared, to prevent recurrence.

Rise in intra-ocular tension and secondary glaucoma should be watched for and its presence suspected when pain sets in and failure of vision, unaccounted for by opacities in the media, occurs. For its management, see Therapy of Glaucoma.

Atropine conjunctivitis may occur in susceptible individuals within a day or two. It consists of conjunctival congestion and chemosis with redness of the lid often spreading to the cheek, so as to resemble erysipelas. It calls for the discontinuance of the atropine, the use of Solution of Epinephrine diluted to one-fourth strength (1:4,000) and the application of cool compresses. Calamine lotion may be applied to the inflamed skin. If mydriasis is still imperative, 1 per cent Scopolamine Hydrobromide solution should be employed, of which one drop at a time should be instilled with the same precautions as for atropine, as toxic symptoms occur in many persons.

(*b*) Heat may well be combined with the use of the mydriatic. This is perhaps best applied by pouring, by means of a spoon, a saturated solution of Boric Acid, as hot as can be tolerated, over the closed lids for fifteen minutes every three or four hours. Small heating lamps may be effectually used.

(*c*) Leeching is employed instead of the heat in cases in which there is much hyperemia and severe pain. Two leeches are applied near the external canthus of the eye. To make the leech bite where one desires, the animal is confined by means of a small wide-mouth bottle applied with its mouth down to the area. After the leeches have dropped off, the bleeding is encouraged by means of sterile hot sponging.

3. *Systemic Measures.*—(*a*) Salicylates should be employed in large doses, such as are given in the treatment of rheumatic fever (q. v.), to secure the analgesic and antiphlogistic effect of this drug. Slight nausea or tinnitus should not be considered an indication for lessening the dose, nor albuminuria, excepting in patients with preexisting nephritis. Hence the urine should always be examined before administration of the drug is commenced. The dose that produces the desired effect should be maintained for four or five days, then cut to half and continued for several days after all symptoms of inflammation have subsided. When salicylate is not well borne, especially if it produces emesis, Neocinchophen (0.3 Gm. tablets) should be given in 1 Gm. doses eight to ten times a day. It is also a useful succedaneum to salicylate in long drawn out cases, provided it is not employed in cases in which liver disorder is known to be present and a careful watch for toxic symptoms is exercised.

(*b*) Proteotherapy should be employed in severe cases and in those resistant to salicylates, which should then be stopped at least for a day or two, to permit the febrile reaction to take place unchecked, so that one can judge whether a reaction of sufficient intensity has been secured. Typhoid-paratyphoid vaccine is injected intravenously in a dose of 30 million organisms to begin with. This is increased to 50, 60 or 70 and even 100 million at subsequent injections, depending on the resulting reactions. To measure such dosage, it is necessary to employ a tuberculin syringe and to dilute the commonly used vaccine, which contains 1,000 million organisms per cubic centimeter, to one tenth. This is done by drawing up 0.1 cc. of the vaccine in the syringe, which is then filled with physiologic solution of sodium chloride to 1 cc. and the solution is mixed by means of an air bubble. A dose of 0.3 cc. of this dilution will contain 30 million organisms. The intervals between injections depend on the reaction. In critical conditions the next injection may be given when the patient has been free from fever for twenty-four hours or when the blood count has returned to normal for the same length of time. In general, the best interval between injections is two fever-free days.

Confinement in bed is, of course, necessary in all severe cases and especially during the time of salicylization or of proteotherapy.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

ILLINOIS INFRA-RED LAMP ACCEPTABLE

Manufacturer: Illinois Surgical Supply Company, Chicago.

The heating element of this lamp is a single bar type about 2¾ inches long and 1½ inches in diameter and is made of ceramic material and resistance wire. Its rated capacity is about 500 watts. The burner is mounted in a 10 inch polished aluminum reflector, 6 inches deep.

Illinois Infra-Red Lamp.

The upright and reflector are mounted on a flat base weighted to prevent tipping. The cross bar, supported on a hinge joint, has a freedom of motion of 7½ inches and can be rotated through an arc of almost 180 degrees. The upright may be extended to a distance of 22 inches. The maximum height is 72 inches.

One unit was tested for physical efficiency in a laboratory acceptable to the Council. When connected to a 110 volt line, the current reading was 4 amperes or 448 watts. A plane in the air, 70 cm. in diameter, 1 meter from the edge of the reflector and perpendicular to the center line through the heating element, was surveyed for radiation distribution. Within a smaller area 50 cm. in diameter directly in front of the heating element, the radiation distribution was relatively uniform and free from hot spots. In this 50 cm. circle the radiant energy was 48 per cent more than at the remaining part of the 70 cm. circle on the periphery. For such a small unit, the radiation distribution is quite satisfactory.

The unit was tried out in a clinic acceptable to the Council. From a clinical standpoint the lamp was found to be satisfactory for treatment when infra-red radiation is indicated.

The Illinois Infra-Red Lamp, therefore, is included in the Council's list of accepted devices.

VIBRATHERM NOT ACCEPTABLE

Manufacturer: The Vitaphore Company, Los Angeles.

According to the firm, this device appears to have unlimited possibilities. It is recommended for afflictions such as frequent night rising, bladder weakness, backaches and headaches, arm, leg and foot pains, sciatica, neuritis, chronic constipation, piles (hemorrhoids), lack of energy, worry and fears, sexual impotence, irritability, insomnia, decreased mental efficiency, and pelvic disorders.

The device is a vibratory massage outfit and operates only on alternating current. The unit submitted to the Council was examined along with the advertising matter. The front page of the circular "Your Key to Health, Youth, Vitality" carries the statement "Why You Are Old at Forty," giving one the impression that the answer is enclosed. On the same page it is stated "Prolong Your Life—Without the Use of Drugs or the Recourse to Surgery."

On the next page the manufacturer makes the statement that women have a pseudo prostate gland attached to the neck of the bladder and the same causes which interfere with the function of the male prostate cause similar disorders in women. Farther on, on the same page, it is stated that slowing up and retention of acid, caustic and poisonous material causes irritation and congestion. Then the firm writes that further neglect may compel the recourse to surgery, which destroys all hope of ever again enjoying normal, vigorous vitality, and in bold, vigorous type it states that not one man in a hundred need face that ordeal.

On the next page, we are told, "The years of research for the correct method to remove the cause of pelvic disorders, led to the invention of the VIBRATHERM."

Under the heading "Dilation" some very striking statements are set forth, and the claim is made that through their machines "a perfect therapeutic treatment is created." On pages 8 and 9 of the pamphlet, under the illustration of the Vibratherm, the statement is made that "Vibratherm treatments taken in the privacy of your home will be fully as effective as those being given by physicians using our professional model."

Then there is given a great list of testimonials from men who say they have been cured by the machine as well as from physicians who have used it in their practice. As a final reminder, on the back cover is given a list of the diseases for which one should use Vibratherm.

Nothing in the way of evidence has been submitted to substantiate the aforementioned doubtful statements.

In view of the unwarranted and misleading claims in the advertising matter, the Council on Physical Therapy voted to omit the Vibratherm from its list of accepted devices.

ELLIOTT TREATMENT MACHINE ACCEPTABLE

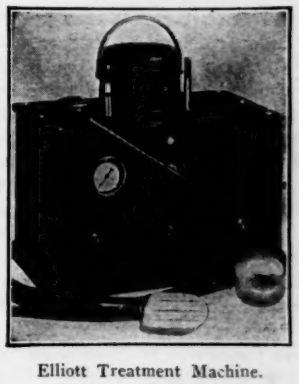
Manufactured for and distributed by the Treatment Regulator Corporation, Detroit, and the A. S. Aloe Company, St. Louis.

The Elliott Treatment Machine is recommended for applying heat therapy for the treatment of inflammatory diseases of the pelvis. Treatment is accomplished by prolonged and sustained application of heat. Hot water, the temperature of which may be controlled by the physician, is circulated through anatomically shaped, distensable applicators made of latex.

The machine measures approximately 17 by 11¼ inches at the bottom and 15 inches in height and weighs 25 pounds. A copper water tank holds a little over 2½ quarts of water. The top of the water tank is made of cast bronze and supports a motor, which operates on either alternating or direct current. The unit requires about 150 watts of power.

The motor propels a dual action centrifugal turbine, which is immersed in the water in the tank at all times. The centrifugal action of this pump creates a continuous pressure or outflow of the water and, at the same time, a continuous and steady suction for the return flow from the applicators. Each part of the pump is made of cast bronze.

The machine is an electrical device which serves two purposes: first, to heat water by electricity to a desired temperature between 100 and 130 F., automatically maintaining such temperature as desired by thermostatic control; and, second, to pump that water through a length of hose to a rubber-bag type of applicator, withdrawing the water at the same time through another hose, thus distending that bag to fit the walls of the orifice under treatment at a constant pressure. The entire unit is quite compact, easily operated, and provided with a handle so that it may be carried without difficulty. It comes equipped with one vaginal bag and one prostatic bag.



Elliott Treatment Machine.

This unit was investigated in clinics acceptable to the Council on Physical Therapy for the conditions recommended, such as inflammatory diseases of the pelvis attended by pain, backache, menstrual irregularities and chronic exhaustion. Since the evidence for the efficacy of the Elliott Machine is not complete in the treatment of sinus and eye infections, recommendation is withheld for the present. The unit was found to give good service and was superior to the hot water douche.

This machine is not accepted by the Council for the purpose of replacing those thoroughly substantiated methods used by the rank and file of the profession for the majority of mild pelvic infections, which in the past have yielded to conventional

forms of therapy. The unit's greatest value, in the opinion of the Council, will be found in the larger clinics or hospitals where the mass of material will enable a careful selection of cases requiring this form of treatment.

In view of the favorable report, the Council voted to include the Elliott Treatment Machine in its list of accepted devices for one year.

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. PAUL NICHOLAS LEECH, Secretary.

THROMBOPLASTIC SUBSTANCES: THROMBOPLASTIN SOLUTION-ARMOUR OMITTED FROM N. N. R.

In view of the lack of evidence for the therapeutic value of thromboplastic substances other than those designed for external use, the Council in 1930 voted to omit from New and Nonofficial Remedies preparations of thromboplastin designed for subcutaneous or hypodermic administration and revised the general article Fibrin Ferments and Thromboplastic Substances to omit any reference to such use. At present, therefore, only products intended for local use stand accepted. These are:

Kephalin-Armour
Fibrogen Local-Merrell
Thromboplastin Solution-Armour
Thromboplastin Local-Lederle
Thromboplastin Local-Squibb

During the past year there was submitted a thromboplastin for local use. In the consideration of this product a member of the Council suggested that this type of preparation might contain tetanus or Welch bacillus. In view of this, the Secretary of the Council wrote to manufacturers of various thromboplastic substances for information concerning evidence for the sterility of their products. Several of these replies were not entirely satisfactory and the Council's referee prepared a report asking the Council to authorize the Secretary to write to the manufacturers of accepted products requesting that they make satisfactory tests for the sterility of their products. Before this report could be submitted to the Council, information was received concerning an untoward incident in a large eastern hospital.

During the past four years there were observed in the institution referred to four cases of B. Welchii and three cases of B. tetani postoperative infections. It was reported to the Council that most of these occurred after prostatectomy. The occurrence caused a thorough reinvestigation of all the surgical procedures of the institution. The operating rooms were quarantined, the instruments were autoclaved in a central sterilizing room, and the efficiency of the autoclaves was controlled by temperature and pressure automatic records. Nevertheless, a postoperative infection appeared from time to time. Late in 1934, according to the statement made to the Council, it seemed advisable to take a culture of Thromboplastin-Armour which had been used in the prevention of postoperative bleeding. To the surprise of the investigator the Thromboplastin was found to contain B. subtilis, Staphylococcus aureus, B. proteus, enterococcus and B. Welchii. This information was communicated to the Council.

As a result of this incident, a bacteriologic examination of samples of commercial thromboplastic preparations was made for the Council. The work was carried on under the supervision of one of the members of the Council, who himself made cultures from six of the samples. The following is a report summarizing the procedure and results of the examination:

Report on Bacteriologic Examination of Thromboplastic Preparations

All of the specimens except one were in unopened containers purchased on the open market by the Secretary or his agents in Chicago and other cities. Four bottles of Armour's Thromboplastin Solution and two bottles of Squibb's Thromboplastin were received through the Secretary from Dr. Gregory Shwartzman of New York.

The containers were opened with sterile precautions and material was withdrawn for stains and cultures. Cultures were made on blood agar plates, dextrose infusion broth and cooked meat medium. These were incubated aerobically and anaerobically at 34 or 37.5 C. The amounts of each preparation used for the inoculation of tubes containing about 10 cc. of liquid mediums were 0.01, 0.1 and 1 cc. Loopfuls were streaked on plates. Animals were inoculated with a few of the cultures. No attempt was made to identify all the bacteria in all the cultures.

I. Thromboplastic preparations of Armour & Co., Chicago. Thromboplastin Solution-Armour. Listed in New and Nonofficial Remedies, 1934, p. 209. Six 25 cc. bottles examined. Each bottle had a cellophane cover over a bakelite screw cap.

(1) Thromboplastin Solution-Armour; 25 cc. bottle. Lot No. 101119. Expiration date Nov. 10, 1935. Numerous bacteria, about 1,000 colonies per cubic centimeter as determined from plates. Various types of spore bearing bacilli. No gas formers. No cocci found.

(13) Thromboplastin Solution-Armour; 25 cc. bottle. Lot No. 101175. Expiration date Dec. 19, 1935. Numerous bacteria, gram-negative and gram-positive spore-bearing bacilli, possibly eleven different varieties. No cocci found. B. Welchii (or a closely related organism) isolated from anaerobic culture. This organism was pathogenic for a guinea-pig.

The following specimens in unopened bottles were received from Dr. Shwartzman:

(C) Thromboplastin Solution-Armour, Lot No. 101176; 25 cc. bottle. Expiration date Oct. 11, 1935. Numerous varieties of aerobic and anaerobic bacteria, chiefly spore-bearing bacilli. A gas forming organism resembling B. Welchii found in anaerobic cultures.

(D) Thromboplastin Solution-Armour, Lot No. 101176. Expiration date Oct. 11, 1935. Many varieties of aerobic and anaerobic spore-forming bacilli. Streptococcus viridans? Diphtheroids. Anaerobic bacillus resembling B. Welchii present.

(E) Thromboplastin Solution-Armour, Lot No. 1011173. Expiration date June 6, 1935; 25 cc. bottle. Several varieties of aerobic and anaerobic spore-forming bacilli. Gas-forming anaerobic bacillus resembling B. Welchii.

(F) Thromboplastin Solution-Armour, Lot No. 101176. Expiration date Oct. 11, 1935; 25 cc. bottle. Several varieties of gram-negative and gram-positive spore-bearing bacilli in aerobic and anaerobic cultures. Colonies of gram-positive cocci. Gas forming organism resembling B. Welchii in anaerobic cultures.

Cultures of the Armour preparations had a putrid cheesy odor. There were terminal spore-bearing bacilli in the anaerobic cultures. Mice were inoculated with material from five of these cultures. None developed tetanus.

II. Thromboplastic preparations of Ciba Company, Inc., New York. None listed in New and Nonofficial Remedies.

(7) Coagulen-Ciba (Sterilized). Carton of five 5 cc. ampules. Control No. 41863. No expiration date. One ampule examined. Sterile.

(8) Coagulen-Ciba (Sterilized). Carton containing one 20 cc. ampule. Control No. 43163. No expiration date. Sterile.

(12) Coagulen-Ciba (Sterilized). Control No. 39443. No expiration date. One ampule examined from carton of five. Sterile.

(17) Coagulen-Ciba (Sterilized). Carton with one 20 cc. ampule. No expiration date. Control No. 28253. Sterile.

III. Thromboplastic preparations of Lederle Laboratories, Inc., Pearl River, New York.

(4) Thromboplastin Local-Lederle. Listed in New and Nonofficial Remedies, 1934, p. 210; 20 cc. vial. Lot No. 118 H 1585 A. Expiration date 5-1-36. Sterile.

(16) Thromboplastin Local-Lederle. Lot No. 118 H 1619 A. Expiration date 6/3/36; 20 cc. vial. Sterile.

IV. Thromboplastic preparations of William S. Merrell Co., Cincinnati.

(5) Fibrogen Local-Merrell, No. 92. Listed in New and Nonofficial Remedies, 1934, p. 208; 7 cc. bottle. Expiration date Nov. 1934. Sterile.

(6) Fibrogen Oral-Merrell, No. 89. Not listed in New and Nonofficial Remedies. Lot No. 4 K 8022. Expiration date March 1936. Cartons of 3 cc. vials. Sterile.

(10) Fibrogen Local-Merrell, No. 92. Lot No. 4 F 5939. Expiration date December 1935; 7 cc. bottle. Sterile.

(15) Fibrogen Oral-Merrell, No. 89. Lot No. 4 B 1624. Carton of 3 cc. vials. Expiration date April 1935. Sterile.

V. Thromboplastic preparations of Parke, Davis & Co., Detroit.

(11) Hemostatic Serum (Lapenta) Bio 72. Parke, Davis & Co. Lot No. 022094A. Expiration date 9/15/37; 5 cc. vial. Sterile.

VI. Thromboplastic preparations of E. R. Squibb & Sons, New York.

(2) Thromboplastin Local-Squibb. Listed in New and Nonofficial Remedies, 1934, p. 210. Lot No. 53088; 20 cc. vial. Expiration date 7-23-36. Sterile.

(3) Thromboplastin Local-Squibb. Lot No. 52315; 20 cc. vial. Expiration date 3-1-36. Sterile.

(9) Thromboplastin-Local-Squibb. Lot No. 53338; 20 cc. vial. Expiration date 10-15-36. Sterile.

(14) Thromboplastin Local-Squibb. Lot No. 51429; 20 cc. vial. Expiration date 11-27-35. Sterile.

(A) Thromboplastin Local-Squibb; 20 cc. vial received unopened from a correspondent. Lot No. 53345. Expiration date Nov. 22, 1936. Sterile.

(B) Thromboplastin Hypodermic-Squibb. Not listed in New and Nonofficial Remedies. Unopened; 20 cc. vial received from a correspondent. Lot No. 53611. Expiration date Nov. 13, 1936. Sterile.

VII. Thromboplastic preparations of U. S. Standard Products Co., Woodworth, Wis. Not listed in New and Nonofficial Remedies.

(18) Thromboplastin Local-U. S. Standard Products Co.; 20 cc. vial. Marked in pencil "447." Serial No. 7 A1. Expiration date Nov. 7, 1934. The carton had been opened before it was received by the examiner. Cultures: spore-forming aerobic bacilli. No gas formers.

Summary

PREPARATION EXAMINED:	RESULTS
I. Thromboplastin Solution-Armour. Six 25 cc. bottles.	All specimens contained numerous bacteria, chiefly spore-bearing aerobes and anaerobes. Streptococci and diphtheroids in some. Organism closely resembling B. Welchii found in five of the six samples.
II. Coagulen-Ciba.* Four ampules.	Sterile.
III. Thromboplastin Local, Lederle. Two 20 cc. vials.	Sterile.
VI. Fibrogen, Local and Oral, Merrell. Four vials.	Sterile.
V. Hemostatic Serum (Lapenta), Parke, Davis & Co. One vial.	Sterile.
VI. Thromboplastin, Local and Hypodermic, Squibb. Six vials.	Sterile.
VII. Thromboplastin Local—U. S. Standard Products Co. One vial.	Package previously opened. Spore-bearing bacilli, aerobic.

No tetanus bacilli were found in any specimen.

* Coagulen-Ciba was omitted from N. N. R. in 1920. See Reports of the Council on Pharmacy and Chemistry, 1920, p. 53.

The Council considered the foregoing report and as a result voted to omit Thromboplastin-Armour from New and Nonofficial Remedies until satisfactory assurance is given that its manufacture is conducted under such conditions as to preclude the danger of contamination, and until such time as a number of specimens found on the market shall have been found to be sterile. The Council voted further that all manufacturers of accepted thromboplastic substances be requested to submit evidence of the sterility of their respective products and that no thromboplastic substance be accepted for New and Nonofficial Remedies until satisfactory evidence is given that the preparation is sterile.

When the foregoing report was sent to Armour & Co., the firm promptly replied stating that it had confirmed the findings of the Council. It immediately withdrew Thromboplastin Solution-Armour from the market and has stated that it will not promote the product in the future. Concerning the difficulty of sterility the firm stated:

"We confirm the Council's findings as far as nonsterility of our Thromboplastin Solution is concerned. We should, however, like to make the following comments on the referee's report. To any one not intimately acquainted with bacteriology, its nomenclature and group classification, the referee's report may readily convey the idea that our Thromboplastin Solution was grossly contaminated with the most virulent pathogenic organisms. The use of a loose term like "Welchii-like" organism might readily include nonpathogenic organisms. . . .

"We have manufactured Thromboplastin Solution according to the method of Hess since 1917 without a single complaint until the present difficulty arose. As soon as the matter was called to our attention, the product was withdrawn from the market as we do not want any of our preparations subjected to criticism. The distribution of Thromboplastin Solution has been limited and confined to a few of the larger cities in this country. Our yearly sales amounted to only a few hundred bottles. For these reasons we feel confident that the withdrawal has been efficient.

"It has always been our rule to retain reserve samples from each batch of products made and offered for sale by us. As a consequence we have reserve samples representing the various lots of Thromboplastin Solution examined by the referee. We have made a very careful study of the bacterial flora of these reserve samples. In no instance have we been able to identify or isolate gas gangrene (Cl. Welchii) or tetanus (Cl. tetani) organisms. Intraperitoneal injections of actively growing anaerobic cultures from the various lots of Thromboplastin Solution into a number of guinea-pigs, with absolute negative results, further show the absence of specific pathogens including Cl. Welchii and Cl. tetani. Intimate application of Thromboplastin Solution and cultures recovered from Thromboplastin Solution to freshly lacerated surfaces of a number of laboratory animals failed to produce local or systemic infections, all wounds healing spontaneously.

"We, therefore, maintain that while our Thromboplastin Solution was not sterile it did not contain pathogenic organisms.

"Since receiving your first letter in regard to the sterility of Thromboplastin Solution, we have made a very careful investigation of the whole situation. We have found it a difficult matter to produce absolute sterility in Thromboplastin Solution without a material decrease in blood clotting properties. Filtration through Berkefeld filters of a suspension of brain tissue particles such as Thromboplastin Solution is of course out of the question. The product has been dispensed in stoppered or capped bottles, but since cresol, which is specified as a preservative for Thromboplastin Solution in N. N. R., is not a perfect germicide, the product cannot be considered sterile after the stopper has once been opened. For these reasons we have definitely decided to discontinue the production of Thromboplastin Solution until such time when satisfactory methods of sterilization and proper and safe means of dispensing the product have been worked out."

The Council commends Armour & Co. for the prompt action it has taken. The Council feels, however, that it owes a duty to the profession to keep it informed so that the future may profit by experience of the past; therefore, it deemed it necessary to authorize publication of this report even though the firm has withdrawn the product from the market. The Council points out that the presence of the B. Welchii type of organisms was detected in the examination conducted under the auspices of the Council and also that the presence of B. Welchii was reported by the investigator in the hospital who first discovered the contamination.

PRELIMINARY REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT. PAUL NICHOLAS LEECH, Secretary.

GONOCOCCUS BOUILLON FILTRATE (GONOCOCCUS TOXIN): II

A preliminary report on this preparation, marketed by Parke, Davis & Co. under the name "Gonococcus Filtrate (Corbus-Ferry)," was issued by the Council in 1932 (THE JOURNAL, Feb. 13, 1932, p. 554). At that time the Council postponed consideration of this product to await the development of confirmatory evidence of its clinical value.

In 1934 Parke, Davis & Co. renewed its request for Council consideration, submitting the manuscript of a report by Cumming and Burhans, which had already been proposed for publication in THE JOURNAL. The paper by Cumming and Burhans reports favorable results in the treatment of all stages of gonorrhea with gonococcus filtrate (Corbus-Ferry) and compares the results favorably with those obtained by local and foreign protein methods. It is definitely shown that intradermal administration provokes a prompt, transient exacerbation of symptoms and increases discharge, followed by recession. The authors fail to compare the necessary durations of treatment by gonococcus filtrate with those in other methods of treatment and fail to state the comparative incidence of complications or recurrences, or the number of cases treated by other methods.

Undoubtedly the paper presents suggestive, but not conclusive, evidence that more prompt recession of symptoms and discharge occur with this treatment, but no direct comparison of control methods is made.

While the evidence submitted since publication of the first preliminary report of the Council is favorable to the use of the product, the Council feels that because of its inconclusive nature it is not sufficient to warrant the acceptance of the product at this time. The Council has therefore reaffirmed its previous decision, postponing consideration of Gonococcus Filtrate (Corbus-Ferry) to await the development of confirmatory evidence of its clinical value.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - - "Medic, Chicago"

Subscription price - - - - - - Seven dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, MAY 18, 1935

EFFICACY OF TYPHOID VACCINATION

Although morbidity and mortality rates from typhoid in the United States continue to be low, the efficacy of protective typhoid vaccination continues to be a matter of more than academic importance. The most extensive information on this question is available in the results obtained by the United States Army and Navy.

Cook[1] has recently discussed typhoid prophylaxis in the United States Navy. Compulsory vaccination was ordered in 1911, and by the end of 1912 almost every person in the navy had received three injections of typhoid vaccine. Two periods are thus available for study: twenty-two years before compulsory typhoid inoculation and twenty-two years after. The improvement in sanitary conditions since 1890, and the subsequent reduction in typhoid in the general population, however, necessitate closer scrutiny than the mere record of lowered morbidity and mortality since that time. A comparison between the annual deaths in the navy and in the registration area of the United States gives better evidence of the value of inoculation, since improvements resulting from sanitation may be assumed to be roughly similar. From 1900 to 1905 the death rates were considerably higher in the navy than in the registration area; from 1905 to 1911 they were roughly parallel, but after 1912 there was a sharp drop in the navy as contrasted with a gradual decline in the registration area. While not, perhaps, conclusive, this fact is at least highly suggestive.

Similar lowering of the case and fatality rates from typhoid have been manifest in the United States Army.[2] Patterson, however, presents his material in a somewhat less convincing manner than that for the navy. The fact that there were only 1,529 admissions to sick report from typhoid from more than four million mobilized during the World War is a matter of pride, but sanitary knowledge was so much improved that it is not justifiable to assign this low typhoid rate even largely to vaccination. That vaccination was one of the important factors is probable but is not proved by Patterson's report.

The other major question with respect to typhoid inoculation is the selection of the strain to be used. This question was carefully studied in 1908, at which time the "Rawlins" strain was chosen. It has been in use since that time. The adequacy of this choice has been periodically reviewed and the present status of opinion has been outlined by Hawley and Simmons.[3] They concluded that "the Rawlins strain may not be the best typhoid vaccine strain; but it is our belief that the Army Medical School substrain is no worse today than it ever was." They felt that the vaccine could be improved by increasing its bacterial content within the limits of safety. Further careful investigations are being conducted concerning the efficiency of this strain with a view to ascertaining whether the same strain should be continued or a new one developed. Meanwhile it can be safely reiterated that prophylactic typhoid vaccination is a safe and reasonably trustworthy procedure.

1. Cook, S. S.: Efficacy of Typhoid Prophylaxis in the United States Navy, Am. J. Pub. Health **25**: 251 (March) 1935.
2. Patterson, R. U.: Efficacy of Typhoid Prophylaxis in the United States Army, Am. J. Pub. Health **25**: 258 (March) 1935.
3. Hawley, P. R., and Simmons, J. S.: The Effectiveness of Vaccines Used for the Prevention of Typhoid Fever in the United States Army and Navy, Am. J. Pub. Health **24**: 689 (July) 1934.

RETARDED GROWTH AND LONGEVITY

In the past, studies in nutrition have been concerned chiefly with maintenance of normal health and production of a rapid rate of growth. The latter, in view of the ease with which it may be measured, has served as an indicator for a great many investigations on diet. Foods or food factors that promoted the most rapid rate of gain were generally considered the most advantageous; the idea has gained currency that the promotion of rapid growth is somehow associated with an enhanced state of health. As McCay and Crowell[1] of Cornell University have stated, "The philosophy which dominates the field of nutrition assumes that a young animal which grows rapidly is the ideal for maximum health both during the growing period and during adult life." These authors have pointed out several of the factors that have served to promote this point of view. Among these are the widespread employment for dietary studies of the white rat, which grows to maturity in the short period of about three months, the direct application of studies in growth to stock raising, in which rapid gain is economically profitable, and the widespread interest in infant and child nutrition, in which the rate of growth is used as a measure of dietary adequacy. But in most of the studies that have been made, the effects of the rate of growth in early years on the subsequent health, susceptibility to disease and life span of the adult have received little attention. This is the more surprising, as a negative correlation between rate of growth and longevity has

1. McCay, C. M., and Crowell, Mary F.: Prolonging the Life Span, Scientific Monthly **39**: 405 (Nov.) 1934.

long been suspected. Thus the Cornell investigators quote, among others, Lord Francis Bacon (1561-1626):

> It seems to be approved by experience that a spare and almost Pythagorean diet, such as is prescribed by the stricter orders of monastic life or the institutions of hermits, which regarded want and penury as their rule, produces longevity.
>
> Animals which come later to perfection . . . are longer lived . . .
>
> To grow long and slowly is a sign of longevity and the taller the stature the better the sign. But on the other hand, rapid growth to a great stature is a bad sign but to a shorter stature less bad.
>
> I would have men duly to observe and distinguish that the same things which conduce to health do not always conduce to longevity.
>
> Again there are other things very beneficial in prolonging life yet that are not without danger to the health unless guarded against by proper means.

Until relatively recently, little reliable data were available to substantiate such theses; but increasing information more and more confirms the observations of Francis Bacon and of others who wrote to the same effect before him and since. McCay [2] has summarized the results obtained in several different species. Prolongation of life associated with a retarded rate of growth has been noted in such divergent forms as rats,[3] insects,[4] brook trout [5] and even cantaloup seedlings.[6] For instance, brook trout in which growth was retarded lived about twice as long as those that grew more rapidly. McCay and Crowell have proposed the hypothesis that something is consumed in growth that is essential for the maintenance of life. This concept, as will be noted later, has received independent support in the mathematical studies of Wetzel.[7]

McCay and Crowell recently reported the results of a long series of observations on rats maintained on diets adequate in vitamins, proteins, inorganic salts and fats but deficient in total calories. At the time of weaning, 106 rats were divided into three groups, one of thirty-four animals and the other two of thirty-six each. The members of one group were allowed to grow normally; those of the second were forced to grow very slowly by limiting food intake, and those of the third group were allowed to grow normally for two weeks and were then restricted in food allowance. The animals in which growth was retarded were kept at a stationary weight for from one to four months; at this time a weight increase of about 10 Gm. was permitted. Not until after more than twenty-eight months were these rats permitted to eat freely.

The animals that were kept on a restricted food intake for long periods outlived by a wide margin those that were allowed to eat their full from the time of weaning. Thus the average life span of those that grew rapidly was 509 days for the males and 801 days for the females. Of the two groups the growth of which was retarded, thirteen animals (five males and eight females) were still alive at the end of 1,200 days; not one of the other animals lived that long. Of the rats in the two retarded groups that died, the mean life span was 792 and 883 days respectively for the males and 755 and 824 days respectively for the females. It has been estimated that ten days in the life of a rat is roughly equivalent to one year in the life of a man; on this basis the thirteen surviving slow-growing rats lived for a period exceeding the human equivalent of 120 years. The hair of the retarded animals remained fine and silky long after that of the fast-growing rats had become coarse and unkempt. However, most of the former had become partly or entirely blind.

The inverse relationship of rate of growth and time of onset of senility is also apparent from other investigations. Evans [8] has pointed out that animals injected chronically with preparations containing the growth hormone of the hypophysis show evidence of premature senility. This occurs despite the fact that, as Lee and Schaffer have shown, administration of the pituitary growth hormone results in retention of juvenile chemical characteristics by the tissues. It is not known, however, how long these properties, which normally are found only in young animals, may be retained under prolonged administration of this growth-promoting principle; studies covering an adequately long period have not yet been reported. Other implements for the study of these extremely interesting problems are available, such as thymus extracts, which greatly increase the rates of growth and maturity,[9] and Hanson's pineal extract, which has been found to retard growth.[10] But as yet no information directly bearing on longevity has been reported by the experimenters who have been using these preparations.

Evidence is also available from studies made directly on man that an excessive rate of growth is harmful. Wetzel,[7] in his brilliant mathematical work on the "motion of growth," has demonstrated conclusively that excessive rate of gain during infancy and childhood is associated with an even greater rate of wasteful heat production and that this may have grave consequences. It is apparent that some of the current tenets in the field of nutrition require reconsideration in an effort to determine the optimal rate of growth for each period in life. The relationship which Wetzel has established mathematically between heat production and growth provides an admirable basis for this reconsideration.

2. McCay, C. M.: Is Longevity Compatible with Optimum Growth? Science **77**: 410 (April 28) 1933.
3. Slonaker, J. R.: Stanford University Publications, 1912.
4. Zabinski, J.: J. Exper. Biol. **6**: 360, 1929.
5. Titcomb, McCay and co-workers, cited by McCay.[2]
6. Pearl, Raymond: The Rate of Living, New York, Alfred A. Knopf, Inc., 1928.
7. The Motion of Growth, editorial, J. A. M. A. **103**: 2030 (Dec. 29) 1934. Wetzel, N. C.: On the Motion of Growth; Clinical Aspects of Human Growth and Metabolism, with Special Reference to Infancy and Preschool Life, J. Pediat. **4**: 465 (April) 1934.
8. Evans, H. M.: The Growth Hormone of the Anterior Pituitary, J. A. M. A. **104**: 1232 (April 6) 1935.
9. Asher, L.: Der Einfluss der Thymus auf das Wachstum und die Herstellung eines wirksamen Thymusstoffes Thymocrescin, Endokrinologie **7**: 321 (Nov.) 1930. Rowntree, L. G.; Clark, J. H., and Hanson, A. M.: The Biological Effects of Thymus Extract (Hanson), Science **80**: 274 (Sept. 21) 1934.
10. Hanson, A. M.: Biological Effects of Active Thymus and Pineal Extracts, Proc. Staff Meet., Mayo Clin. **10**: 113 (Feb. 20) 1935.

CULLEN'S SIGN IN RUPTURED ECTOPIC PREGNANCY

In 1919 Dr. Thomas S. Cullen[1] of Baltimore reported a case in which a woman, aged 38, for three weeks had had pain in the right lower quadrant of the abdomen with intermittent attacks of abdominal distention. One week after the onset the umbilical region suddenly became bluish black, although there had been no injury in this region. Prior to opening the abdomen of this woman, Dr. Cullen dictated the following: "The bluish black appearance of the navel unassociated with any history of injury, together with the mass to the right of the uterus, makes the diagnosis of extra-uterine pregnancy relatively certain, although the patient has not missed any period and although there has been no uterine bleeding." At operation the abdomen was found filled with dark blood, and attached to the fimbriated end of the right tube was an extra-uterine pregnancy. Since this report was published, bluish discoloration of the umbilicus in ruptured ectopic gestation has been observed and reported by numerous writers in this country and abroad. In THE JOURNAL, March 4, 1922, Cullen's original colored picture of this condition was reproduced in Novak's article. Recently Smith and Wright[2] reported two cases in the *Lancet*. In one of their cases the bluish discoloration appeared in the lower third of an old appendectomy scar, which had been the site of a drainage tube. In their second case the discoloration closely resembled Cullen's original colored illustration. Many other cases have no doubt been observed but not reported.

The discoloration accompanying Cullen's sign is not always blue; the color depends on the degree of oxidation of the deposited blood pigments and may be any of the various hues that are known to follow an ordinary bruise. As Novak said, a dark bluish discoloration about the umbilicus probably would indicate a recent hemorrhage, and a greenish yellow or orange color would suggest that the intra-abdominal blood had been present some time. No discoloration at all can be expected when the hemorrhage is so rapid that the patient comes under observation soon after it occurs. Likewise, in cases of ruptured ectopic pregnancy that are not associated with intraperitoneal hemorrhage of considerable degree, Cullen's sign probably would not be present. Bluish discoloration around the umbilicus is not a pathognomonic sign of ruptured ectopic pregnancy, for it has been found in other abdominal conditions. Zum Busch reported an example caused by hemorrhage into an adherent ovarian cyst. Schumann records a case which he diagnosed ruptured ectopic pregnancy largely on the basis of Cullen's sign, and laparotomy showed a two months intra-uterine pregnancy associated with purulent bilateral salpingitis, but no free blood in the peritoneal cavity. Sternberg described a case in which bluish discoloration of the umbilicus was associated with hemorrhagic ascites due to adenocarcinoma of the liver. Stutzer observed a brownish blue discoloration of the abdominal wall about the umbilicus in a case without hemorrhagic pancreatitis. After reviewing the literature, Smith and Wright conclude that bluish discoloration about the umbilicus is a rare indication of intraperitoneal hemorrhage. For example, Stein in 106 cases and Jonas in ninety cases did not observe Cullen's sign. In a clinical analysis of 410 cases of ectopic pregnancy at Bellevue Hospital, Lavell found that Cullen's sign was rarely seen; but it was observed twice in the same patient. In a study of 167 consecutive cases at the University of Pennsylvania, Behney found that Cullen's sign was noted once. Novak believes however that, to all intents and purposes, Cullen's sign may be considered especially applicable to the diagnosis of ruptured extra-uterine gestation.

Several theories have been proposed to explain this phenomenon. The most plausible explanation seems to be found in the lymphatics of the umbilical region. The changing shades of colors may be explained as due to the oxidation of absorbed blood pigments traveling in lymphatics connecting the umbilicus with the peritoneal cavity.

1. Cullen, T. S.: Bluish Discoloration of the Umbilicus as a Diagnostic Sign Where Ruptured Extra-Uterine Pregnancy Exists, from "Contributions to Medical and Biological Research, dedicated to Sir William Osler, in Honor of His Seventieth Birthday, July 12, 1919, by His Pupils and Co-Workers."

2. Smith, Irwin, and Wright, F. J.: Cullen's Sign in Ruptured Ectopic Gestation, with a Report of Two Cases, Lancet **1**: 930 (April 20) 1935.

Current Comment

A BLOOD TRANSFUSION CONFERENCE

It is doubtful whether the practice of blood transfusion has been more extensively studied anywhere in recent years than in Soviet Russia. Word has just been received of a blood transfusion conference that took place in Moscow in February and was attended by representatives of many branches of the Hematology and Blood Transfusion Institute from different sections of the Soviet Union. The director of this institute, Dr. Bagdasaroff, pointed out that at present blood is being saved for periods of from fourteen to twenty-two days for purposes of blood transfusion, and a few cases are reported in which blood preserved up to thirty-four days has been used. In the preservation of blood, from 5 to 6 per cent citrate solution is used as well as dextrose-citrate and a special formula developed by that institute and apparently of secret composition. Blood transfusions have been made in approximately 1,000 cases with blood obtained from dead bodies within six hours after death. It would seem that such blood possesses the property of remaining liquid because of fibrinolysis and thus may be preserved without added citrate. The theory was advanced by S. S. Bruchanenko that the blood of the corpse remains liquid because of the presence of a large amount of antithrombin, which in the case of sudden death enters into the blood from the lungs. Extensive reports were

read in this conference on the selection of a donor, the complications of blood transfusion and the practical application of methods of combining blood transfusion with the administration of iron and other therapy. Some interesting reports were also presented on the possibility of transfusion of small doses of incompatible blood as well as of animal blood in order to produce a stimulating reaction in the treatment of severe infections. Among the disease conditions in which blood transfusion had been extensively used were scurvy, pellagra, malaria and gynecologic conditions.

Association News

MEDICAL BROADCASTS

Columbia Broadcasting System

The American Medical Association broadcasts on a western network of the Columbia Broadcasting System each Thursday afternoon on the Educational Forum from 4:30 to 4:45 Chicago daylight saving time (3:30 p. m. central standard time). The next three broadcasts will be delivered by Dr. W. W. Bauer. The titles will be as follows:

May 23. Saving Our Eyesight.
May 30. Holiday. No broadcast.
June 6. Wound Infections.

National Broadcasting Company

The American Medical Association broadcasts under the title "Your Health" on a Blue network of the National Broadcasting Company each Tuesday afternoon from 4 to 4:15 Chicago daylight saving time (3 p. m. central standard time). The next three broadcasts will be as follows:

May 21. Pain, W. W. Bauer, M.D.
May 28. Problems of American Medicine, Morris Fishbein, M.D.
June 4. The Crippled Child, W. W. Bauer, M.D.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Personal.—Dr. William D. Gaines, Lafayette, has been appointed physician to the state prison at Atmore.——Dr. Cornelius S. Hagerty, resident pathologist at Presbyterian Hospital, Chicago, has received an appointment as assistant professor of bacteriology and pathology at the University of Alabama School of Medicine.

Bill Introduced.—H. 300 proposes to prohibit the sale or distribution of barbital, sulphonethylmethane (trional), sulphonmethane (sulphonal), diethylsulphon diethylmethane (tetronal), paraldehyde and chloral or chloral hydrate and any derivatives, compounds or mixtures of any of the foregoing drugs possessing hypnotic properties or effects, except on the written prescription of a licensed physician.

Society News.—Dr. James S. McLester, Birmingham, President-Elect of the American Medical Association, among others, addressed the Tuscaloosa County Medical Society, recently, on "Present Status of Kidney Function Tests."——Speakers before the Northeastern Division of the Medical Association of Alabama in Talladega, recently, in joint session with the Talladega County Medical Society, were Drs. John A. Martin, Montgomery, on medical legislation; Clarence K. Weil, Montgomery, hay fever, and Felix M. T. Tankersley, Montgomery, conservative treatment of sinus infections.——Dr. Roy R. Kracke, Emory University, addressed the Jefferson County Medical Society, Birmingham, April 15, on "Relation of Drug Therapy to Agranulocytosis."

DELAWARE

Society News.—Dr. Richard A. Kern, Philadelphia, addressed the New Castle County Medical Society in Wilmington, March 15; his subject was "Clinical Allergy." Dr. Louis H. Clerf, Philadelphia, discussed "Cancer of the Lower Air Passages," April 16.

Quarantine Station Reopened.—The U. S. Quarantine Station at Reedy Island was reopened, April 1, for inspection of vessels, after having been closed for several years. Dr. Barton Brown, acting assistant surgeon, who has been at the immigration station at Gloucester, N. J., is in charge under the direction of Dr. Charles W. Vogel, medical director and officer in charge of the Marcus Hook, Pa., quarantine station.

FLORIDA

Bill Passed.—H. 29 has passed the house and the senate, proposing to provide for a system of compensating workmen for injuries arising out of and in the course of their employments and for such diseases or infections as naturally or unavoidably result from such industrial injuries. The employer is to furnish medical, surgical and other remedial treatment, nursing and hospital service, medicines, crutches and apparatus for such period as the nature of the injury or the process of recovery may require. Only in the event that the employer fails to furnish the services, after request by the workman, is the workman to be allowed the privilege of selecting his own physician, at the employer's expense.

Bills Introduced.—H. 831 proposes to repeal the existing naturopathic practice act and to enact a new law creating a board of naturopathic examiners and regulating the practice of naturopathy. The bill proposes to define naturopathy as "the use of and practice of physiological, mechanical and material health sciences to aid in purifying, cleansing and normalizing human tissue for the preservation or restoration of health according to the fundamental principles of anatomy, physiology, and applied psychology as may be required. Naturopathic practice employs, among other agencies, phytotherapy, dietetics, psychotherapy, suggesto-therapy, hydro-therapy, zone-therapy, biochemistry, external applications, electro-therapy, mechano-therapy, helio-therapy, mechanical and electrical appliances, hygiene, first-aid, and sanitation." H. 854 proposes to authorize the state tuberculosis board to divide the state into not more than five districts and to establish and operate in each district a sanitarium for the treatment of persons suffering from tuberculosis. The board is to be authorized to obtain loans from the federal government for the erection of such sanitariums.

GEORGIA

Commemoration of Crawford Long.—The annual observance of Crawford W. Long Day was held throughout the state, March 30, according to the *Bulletin* of the Fulton County Medical Society. The celebration marks the discovery of ether anesthesia by Dr. Long in 1849. The program this year centered around the University of Georgia, Athens, where Long graduated with the degree of master of arts in 1835. The orator was Dr. Max Cutler, Chicago. At Jefferson a plaster bust of Long made by Dr. George H. Noble Jr., Atlanta, was unveiled. A portrait representing Dr. Long in his later years was given to the Crawford W. Long Memorial Hospital, Atlanta, by the Children of the Confederacy, March 31. On this occasion Mrs. Eugenia Harper, a daughter of Dr. Long, presented to Dr. Cutler a paper knife made of wood from the mantel that formerly stood in her father's office.

ILLINOIS

Industrial Meeting.—The Central States Society of Industrial Medicine and Surgery will meet in Rockford, May 21. Included on the program will be a symposium on fractures by Drs. Ralph M. Carter, Green Bay, Wis.; William R. Cubbins, James J. Callahan, Carlo S. Scuderi and George L. Apfelbach, Chicago; addresses by Drs. Adrien H. P. E. Verbrugghen, Chicago, on "Injuries of the Brain and Spinal Cord"; Clarence O. Sappington, Chicago, "Occupational Disease Hazards," and Frederick W. Slobe, Chicago, "Injection Treatment of Hernia."

State Medical Meeting at Rockford.—The eighty-fifth annual meeting of the Illinois State Medical Society will be held at Rockford at the Faust Hotel, May 21-23, under the presidency of Dr. Charles S. Skaggs, East St. Louis. The Winnebago County Medical Society will be host. Dr. James S. McLester, Birmingham, Ala., President-Elect, American Medical Association, will deliver the oration in medicine. Dr. Martin Nordland, Minneapolis will give the oration in surgery, on "The Rôle of Surgery in the Disturbances of the Thyroid

Gland." According to the tentative program there will be symposiums on cataract and obscure fevers. In addition, papers will be presented by the following physicians, among others:

Dr. Clarence A. Earle, Des Plaines, Importance of Intradermic Reactions as an Aid to Diagnosis and Degree of Susceptibility to Disease.
Dr. Michael Zeller, Chicago, Leukopenic Index in Intractable Asthma.
Dr. Maximilian J. Hubeny, Chicago, Roentgenology of the Alimentary Tract.
Dr. Dallas B. Phemister, Chicago, The Surgery of Bone Tumors.
Dr. James C. Thomas Rogers, Urbana, Visceroptosis—Glénard's Disease.
Dr. Joseph Greengard, Chicago, Passive Immunity in Infants and Their Response to Diphtheria Toxoid.
Clarence W. Muehlberger, Ph.D., Chicago, Blood Grouping Tests in the Medicolegal Determination of Nonpaternity.
Dr. Perry B. Goodwin, Peoria, Roentgen Study of Lesions of the Urinary Bladder.
Dr. Robert A. Arens, Chicago, Differentiation of Radiopaque Shadows in the Right Upper Quadrant.

The secretaries' conference will be held Tuesday morning and among other speakers will be addressed by Dr. Olin West, Secretary and General Manager, American Medical Association, on "Medical Economic Problems of Today and the Future." A special pediatric program will also be held Tuesday morning. The veterans' service committee will hold its annual dinner Tuesday evening.

Chicago

Dr. Leary Gives Hektoen Lecture.—Dr. Timothy Leary, professor of pathology, bacteriology and medical jurisprudence, emeritus, Tufts College Medical School, Boston, will deliver the eleventh Ludvig Hektoen Lecture of the Frank Billings Foundation at Thorne Hall, Northwestern University, May 24. His subject will be "Atherosclerosis, the Important Form of Arteriosclerosis, a Metabolic Disease."

Dr. Wilder Awarded the Dana Medal.—The Leslie Dana Gold Medal of the National Society for the Prevention of Blindness will be awarded to Dr. William H. Wilder, emeritus professor of ophthalmology, Rush Medical College, Chicago, at ceremonies in St. Louis today, May 18. Dr. Wilder was selected for the award, given in recognition of his work in the conservation of vision, by the national society in cooperation with the St. Louis Society for the Blind, one of whose directors is the donor of the medal. Dr. Wilder, a graduate of the Medical College of Ohio in 1884, served as professor of ophthalmology at Rush from 1907 to 1926. In 1907-1908 he was chairman of the Section on Ophthalmology of the American Medical Association, in 1918 president of the American Ophthalmological Society and in 1931 president of the American Academy of Ophthalmology and Otolaryngology. At present he is secretary of the American Board of Ophthalmology and vice president of the Illinois Society for the Prevention of Blindness. He has written many articles on ophthalmic surgery and has collaborated in several books dealing with his specialty.

Society News.—Speakers at the meeting of the Chicago Gynecological Society, May 17, were Drs. George de Tarnowsky, on tubal reimplantation; Henry Buxbaum, outpatient obstetrics; William A. Thomas, Edward D. Allen and Carl Philip Bauer, toxemia of pregnancy. The operative clinical meeting was held in the morning of the same day at St. Luke's Hospital.——Drs. Willis C. Campbell, Memphis, Tenn., and John D. Claridge addressed a joint meeting of the Chicago Orthopedic Society and the Institute of Traumatic Surgery, May 10, on "Operative Procedures for Rupture of the Crucial and Lateral Ligaments of the Knee" and "Bilateral Traumatic Dislocation of the Hips," respectively.——Drs. Ruth Tunnicliff and George Milles, among others, addressed the Chicago Pathological Society, May 13, on "Effect of Dissociation of Streptococci on Their Fibrinolytic and Antifibrinogenic Activity," respectively.——The Chicago Tuberculosis Institute held its annual meeting, May 10, with a program, including, among others, Drs. Midian O. Bousfield, speaking on "Tuberculosis and the Negro" and Max Biesenthal, "Thirty Years of Work in Tuberculosis."

INDIANA

Specialty Society Meeting.—Dr. Joseph R. Dillinger, French Lick, was elected president of the Indiana Academy of Ophthalmology and Otolaryngology at its annual meeting in Indianapolis, April 10. Drs. George E. Shambaugh Jr. and Thomas D. Allen, Chicago, were guest speakers, on "Significance of Diplacusis in Ménière's Syndrome" and "Standards in Ophthalmologic Practice," respectively. Next year's meeting will be held in Martinsville.

Annual Graduate Course.—Indiana University School of Medicine will conduct its annual graduate course in general medicine and surgery and the specialties, May 20-June 1. The mornings will be given over to clinics and the afternoons to discussions. Out of state speakers at the evening sessions will include Drs. Walter L. Bierring, Des Moines; Thomas G. Orr, Kansas City; Arlie R. Barnes, Rochester, Minn., and Preston Kyes, Chicago. No registration fee will be charged to Indiana physicians. Out of state physicians, however, will be charged $10. Further information may be had from the registrar of Indiana University School of Medicine, Indianapolis.

IOWA

Personal.—Dr. Frank W. Dean, Council Bluffs, has been made a life member of the Iowa State Medical Society.

Annual Renewal Fees Due Before June 1.—All licenses to practice medicine and surgery in Iowa expire annually on June 30. To renew such a license a licentiate must make a written application to the state department of health before June 1, enclosing the renewal fee of $1. If a license expires by reason of the licentiate's failure to renew it, it can be reinstated without reexamination only on the recommendation of the board of health and the payment of the overdue fees.

Society News.—Dr. Charles H. Arnold, Lincoln, Neb., addressed the Black Hawk County Medical Society, Waterloo, April 16, on "Choice of Anesthesia." At the February meeting the society adopted a resolution endorsing the stand of the House of Delegates of the American Medical Association at the special meeting in Chicago, February 15-16, against socialized medicine. Copies were sent to senators and congressmen.——A special meeting of the Des Moines Academy of Medicine and the Polk County Medical Society will be addressed, May 20, by Dr. Richard H. Jaffe, Chicago, on "Tumors of the Ovaries, with Special Reference to Their Hormone Action." A symposium on cardiovascular renal disease was presented before the meeting, April 30, by Drs. Charles C. Walker, Oran W. King, Wilbert W. Bond and Daniel J. Glomset.

KENTUCKY

Memorial to Jane Todd Crawford.—The Kentucky State Medical Association is to unveil a monument, May 30, in McDowell Park, Danville, to Jane Todd Crawford, the woman on whom Ephraim McDowell performed the first ovariotomy, in 1809. Dr. Stewart R. Roberts, Atlanta, will deliver the memorial address and brief addresses will be made by Dr. Morris Fishbein, Chicago, editor of THE JOURNAL; Mrs. Arthur T. McCormack, Louisville, wife of the secretary of the state medical association, and Judge Basil Richardson of the Court of Appeals of Kentucky. Dr. William N. Wishard, Indianapolis, will take part in the unveiling ceremony.

Increased Mortality Rate.—Preliminary figures issued by the state board of health indicate that the general death rate in Kentucky in 1934 was 11.3 per thousand of population as compared with 10.8 in 1933. Infant mortality increased by almost 500 deaths, and deaths among persons 65 years old and over by more than 600. Heart disease, the leading cause of death, increased from 5,055 deaths in 1933 to 5,490 in 1934. The rate for pneumonia rose from 83.2 to 89.1. The department calls special attention to the rise in deaths from automobile accidents from 498 in 1933 to 625 last year. The diphtheria death rate, which was noted as the highest in the United States in 1933, fell from 16.3 to 13.4, a result attributed to special efforts to have preschool children immunized. The tuberculosis rate dropped from 85.9 to 76.3, and the typhoid death rate was reduced from 12 to 11.

MAINE

Society News.—Dr. George A. Tibbetts addressed the Portland Medical Club, April 2, on "Surgery in Blood Diseases."——Dr. Seth M. Milliken, New York, gave an address on "Traction in Treatment of Fractures" before the Cumberland County Medical Society, April 26.——At a meeting of the Kennebec County Medical Association, Gardiner, March 21, Drs. Howard F. Hill, Waterville, and Roland B. Moore, Portland, gave an address on "Newer Concepts in the Management of Labor."

MASSACHUSETTS

Dr. Fitz Named University Marshal.—Dr. Reginald Fitz, associate professor of medicine, Harvard University Medical School, Boston, has been named university marshal in charge of the Harvard University commencement exercises in June, it is reported.

Society News.—Dr. Trygve Gunderson addressed the New England Ophthalmological Society, Boston, April 16, on "Convalescent Blood for Herpes Zoster."——Dr. Alvah H. Gordon, Montreal, addressed the Harvard Medical Society, April 16, on "Clinical Aspects of Migraine."——A symposium on pneumonia

was presented at a meeting of the Essex South District Medical Society at Middleton, April 3, by Drs. Frederick T. Lord, Roderick Heffron and Richard H. Sweet, Boston.——Dr. Dana W. Atchley, New York, addressed the New England Heart Association, April 26, on "The Rôle of Peripheral Circulatory Failure in Clinical Medicine."——Dr. Kendall Emerson, managing director, National Tuberculosis Association, New York, addressed the Massachusetts Tuberculosis League at its twenty-second annual meeting, April 29, on "The Tuberculosis Program in These Changing Times."——The Obstetrical Society of Philadelphia and the obstetric societies of New York and Washington were the guests of the Boston Obstetrical Society, April 12. Clinics were held at various Boston hospitals and the dinner meeting was addressed by Dr. Henricus J. Stander, New York, on "The Teaching of Obstetrics and Gynecology in the United States."——Dr. Wolfgang F. von Oettingen, Wilmington, Del., was a speaker on the program of a meeting devoted to occupational diseases at the annual Massachusetts Safety Conference, May 6. His subject was "Toxic Vapors, Their Hazards and Control," discussed by Philip Drinker, Ch.E., of the Harvard School of Public Health.

MICHIGAN

Graduate Course. — The Michigan State Medical Society and the University of Michigan Post-Graduate Department have arranged a course in traumatic, emergency and minor surgery at the Receiving and Herman Kiefer hospitals, Detroit, May 20-24.

Personal.—Dr. Perry V. Wagley has been appointed superintendent of the Pontiac State Hospital, succeeding the late Dr. Edmund A. Christian.——Dr. Burton R. Corbus, Grand Rapids, who has been acting secretary of the Michigan State Medical Society, has resigned as councilor of the fifth district; his term as acting secretary will expire in September, when Dr. Clifford T. Ekelund, Pontiac, will take over the duties of secretary.

MISSOURI

Annual St. Louis Clinics. — The annual graduate course and clinical conference of the St. Louis Clinics will be held in St. Louis, May 20-25. The program will be clinical, covering the various branches of medicine, surgery and surgical specialties, including the most recent advances in medicine and the newest methods of diagnostic technic and therapy as well as reviews of the old methods. The clinic has customarily been conducted exclusively by members of the St. Louis Clinics but this year the medical officers of the Seventh Corps Area, U. S. Army, will participate. Sessions will be held at St. Luke's, Missouri Baptist, St. John's, Jewish, St. Mary's, Deaconess, Firmin Desloge, Barnes, DePaul and St. Louis City Isolation hospitals. Four evening meetings will be held at the St. Louis Medical Society Building. The registration fee is $10.

MONTANA

Society News.—Drs. Charles F. Little and John R. Vasko, Great Falls, addressed the Deerlodge County Medical Society, Anaconda, April 9, on "Nonsurgical Biliary Drainage" and "Injuries of the Spine," respectively.

Personal. — Dr. Elmer G. Balsam, Billings, has been appointed president of the Montana State Board of Health, and Dr. Louis H. Fligman, Helena, vice president.——Dr. John C. Dunn, Lewistown, has been named health officer of Fergus County.

NEW MEXICO

State Medical Meeting in Albuquerque. — The New Mexico Medical Society will hold its annual meeting in Albuquerque, May 23-25. A tentative program lists the following guest speakers:

Dr. Howard C. Naffziger, San Francisco, Surgery of Hypertensive States.
Dr. Sylvan L. Haas, San Francisco, Management of Poliomyelitis Deformities.
Dr. Hermon C. Bumpus Jr., Pasadena, Present Methods for Relieving Prostatic Obstructions.
Dr. Albert Soiland, Los Angeles, Radiation Therapy in Various Surface Conditions.
Dr. Robert W. Lamson, Los Angeles, Hay Fever Treatment.
Dr. Alfred J. Scott, Jr., Los Angeles, Acute Contagious Diseases.
Dr. William Warner Watkins, Phoenix, Ariz., Traumatic Bone Lesions Without Fracture.
Dr. William Paul Holbrook, Tucson, Ariz., Present-Day Conception of Arthritis.
Dr. Robert G. Packard, Denver, Fractures of the Shaft of the Femur in Children and Adults.
Dr. George T. Vinyard, Amarillo, Texas, Treatment of Inflammatory Conditions of the Female Pelvis.
Dr. Harvey H. Latson, Amarillo, Texas, Endocrinology.

NEW YORK

Dr. Mahar Appointed Health Officer of Syracuse. — Dr. Gregory D. Mahar, a member of the staff of the Syracuse department of health since 1923, was appointed health commissioner of the city, April 20, to succeed Dr. George C. Ruhland, who recently became health commissioner of the District of Columbia. Dr. Mahar is a native of Syracuse and a graduate of Syracuse University College of Medicine. He entered the department of health shortly after his internship and has served principally in the bureau of communicable diseases.

Personal.—Dr. Merle R. French of the staff of the state department of health, Albany, has been appointed health commissioner of Cortland County to succeed Dr. Daniel R. Reilly. —— Dr. Basil Clarendon MacLean, superintendent of Touro Infirmary, New Orleans, has been appointed superintendent of Strong Memorial Hospital, Rochester, to succeed Dr. Nathaniel W. Faxon. Dr. Faxon recently resigned to go to Boston as superintendent of Massachusetts General Hospital, succeeding the late Dr. George H. Bigelow.

Outbreak of Food Poisoning. — About 750 persons in Westchester County were stricken with food poisoning, April 23 and 24, as a result of eating pastries with cream filling from a bakery in White Plains. Specimens of the filling examined in the laboratory of the state department of health in New York yielded colon bacilli, staphylococci and streptococci, and samples of egg yolk taken from the bakery also contained the organisms. The eggs were distributed from Chicago. It was estimated that many more cases occurred but were not reported to the health authorities. Sixteen cases were reported in the Bronx, New York, where several dozen cream puffs and éclairs from the White Plains bakery were sold. As soon as the epidemic was reported the bakery made every effort to recall the pastries sold and voluntarily discontinued making the cream products until cool weather. The plant itself was found to be in excellent sanitary condition. Dr. Matthias Nicoll Jr., county health commissioner, announced that he would ask the board of health to adopt an ordinance prohibiting the sale of custard filled pastries during the summer. It was reported, April 29, that federal food and drug inspectors were checking the source of the eggs.

New York City

New Tumor Institute.—St. Clare's Hospital announces the establishment of a tumor institute, opened May 15, in conjunction with the hospital. A high voltage therapy machine capable of utilizing 200,000 volts has been installed along with the proper filters for correct application. Radon and 400 mg. of radium are available. Members of organized medicine will be welcomed at all times and are especially invited to attend the hospital's weekly staff conferences.

School of Midwifery to Be Closed.—The Bellevue School for Midwives, operated by the city since 1911, will be closed with the graduation of the present class, Dr. Sigismund S. Goldwater, commissioner of hospitals, announced in April. Changing social conditions have made the school largely superfluous, as evidenced by the fact that only 5,000 women were delivered by midwives in 1934, as compared with 50,000 in 1914; 1,799 women held licenses to practice in New York in 1916, and the present number is 700. The average cost of confinements attended by midwives at the school is $42.05, Commissioner Goldwater said, whereas the city pays private hospitals only $35 for confinements in charity cases.

NORTH CAROLINA

Bill Introduced.—S. 535 proposes to repeal the laws regulating the possession and distribution of narcotic drugs and to enact what the draftsman of the bill cites as the "uniform narcotic drug act." The bill, however, differs from the model uniform narcotic drug act in some important particulars. It omits the provisions in the model bill intended to limit the gross quantity of a habit-forming drug a person can buy in exempt preparations within a period of forty-eight hours.

Society News.—Dr. Byrd C. Willis, Rocky Mount, was elected president of the North Carolina Hospital Association at the annual joint session with the hospital associations of South Carolina and Virginia in Greensboro, April 12.—— Dr. Sankey S. Hutchinson Jr., Bladenboro, entertained the Bladen County Medical Society at dinner, April 9; Drs. Graham B. Barefoot, Wilmington, and Oren Moore, Charlotte, presented papers on "Electrocardiographic Findings in Diagnosis and Treatment of Heart Disease" and "Periodic Fertility in Women," respectively.——Speakers who addressed the New Hanover County Medical Society, Wilmington, April 18, were Drs. Silas Raymond Thompson, Charlotte, on "Common Uro-

logical Conditions"; George Johnson, Wilmington, "Knaus's Theory of Fertility and Sterility," and Ernest S. Bulluck, Wilmington, "Fractures of the Scaphoid Bone."

NORTH DAKOTA

State Medical Meeting at Minot.—The North Dakota State Medical Association will meet at Minot, May 27-28. The opening session will be held Monday evening, May 27, following the meeting of the house of delegates during the day. At this meeting Dr. Clyde E. Stackhouse, Bismarck, will give his presidential address; Dr. Leonard W. Larson, Bismarck, will discuss legislation and Dr. Harry A. Brandes, Bismarck, medical economics. Dr. Lester R. Dragstedt, Chicago, will also speak, on "Experimental Studies on the Etiology of Gastric and Duodenal Ulcer." Guest speakers the second day will be:

Dr. Donald C. Balfour, Rochester, Minn., Surgery of the Gastro-Intestinal Tract.
Dr. Thomas J. Kinsella, Oak Terrace, Minn., A Clinical Evaluation of Collapse Therapy Measures in the Treatment of Pulmonary Tuberculosis.
Dr. Henry F. Helmholz, Rochester, Diagnosis of Acute Appendicitis in Childhood.
Dr. William H. Hengstler, St. Paul, Head Injuries from a Neurological Standpoint.
Dr. Paul A. O'Leary, Rochester, Established Values in the Specific and Nonspecific Treatment of Syphilis.
Dr. Roscoe C. Webb, Minneapolis, Emergency Treatment of Fractures.
Dr. John A. Urner, Minneapolis, Complications of Pregnancy.
Dr. William A. O'Brien, St. Paul, Granulopenia.

The North Dakota Academy of Ophthalmology and Otolaryngology and the North Dakota Public Health Association will hold their annual meetings Monday May 27. A golf tournament will be played Sunday May 26 at the Minot Country Club and the annual banquet will be Tuesday evening at the country club.

OKLAHOMA

Changes in Health Officers.—Recent appointments of county health officers have been announced as follows:

Dr. Benjamin B. Kies, McAlester, Pittsburg County.
Dr. Benjamin F. Johnson, Fairview, Major County.
Dr. Henry B. Fuston, Bokchito, Bryan County.
Dr. Catherine F. T. Brydia, Ada, Pontotoc County.
Dr. Henry K. Speed Jr., Sayre, Beckham County.
Dr. Edwin S. Patterson, Antlers, Pushmataha County.
Dr. William P. Jenkins, Okemah, Okfuskee County.

Tulsa Clinical Conference.—At the spring conference of the Tulsa Clinical Society, April 17-18, clinics were held at Morningside and St. John's hospitals. There were symposiums on obstetrics, head injuries, gonococcic infections and goiter; clinics on orthopedics, injuries to the back and general operative clinics by the hospital staffs. Among papers presented were the following by Tulsa physicians:

Dr. Ivo A. Nelson, Relationship of Laboratory Medicine to Future Medical Practice.
Dr. Bernard L. Branley, Pernicious Anemia.
Drs. Emry G. Hyatt and Delbert O. Smith, Diverticulitis and Diverticulosis of the Gastro-Intestinal Tract.
Dr. Arthur H. Davis, Nasal Accessory Sinus Disease.
Dr. Margaret G. Hudson, Vaccines in the Treatment of Chronic Arthritis.
Dr. Andre B. Carney, Benign and Malignant Tumors of the Female Breast.
Dr. Morris B. Lhevine, Radiologic Diagnosis of Bone Tumors.

The annual golf tournament of the Tulsa County Medical Society was played Thursday afternoon at the Tulsa Country Club, followed by the annual banquet. Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, spoke on "Plans for Economic Security" at the banquet, Wednesday evening, and discussed the work of the Council on Pharmacy and Chemistry at a meeting Thursday.

PENNSYLVANIA

Society News.—Dr. Donald Guthrie, Sayre, addressed the Cambria County Medical Society, Johnstown, April 11, on "The Harmful Effects of Fear and Efforts Directed Toward Its Elimination from the Patient's Mind."——Dr. Edward M. Livingston, New York, addressed the Dauphin County Medical Society and the Harrisburg Academy of Medicine, April 9, on "Basic Approaches to the Diagnosis of Surgical Diseases of the Abdomen."——Dr. Jennings M. King Jr., Pittsburgh, addressed the Fayette County Medical Society, Uniontown, April 4, on "Orthopedics in General Practice."——Dr. Isador Kaufman, Philadelphia, addressed the Lycoming County Medical Society, Williamsport, April 12, on "Physical Signs in the Early Diagnosis of Pulmonary Tuberculosis." Drs. Roy R. Snowden and John P. Griffith, Pittsburgh, conducted the semiannual clinic of the society, May 10, on fractures and gastro-intestinal disorders, respectively. Dr. Snowden also presented a paper on "Diagnosis of Carcinoma of the Stomach," and Dr. Griffith on "Management of Fractures."

Philadelphia

Survey of Tuberculosis in Indians.—Dr. Esmond R. Long of the Henry Phipps Institute, University of Pennsylvania, made a special investigation of tuberculin reactions in several hundred Indian children in New Mexico and Arizona during March. Results will be studied at the institute and embodied in a report to the Office of Indian Affairs at Washington.

Statistician Hoffman Retires.—Frederick L. Hoffman, LL.D., Philadelphia, consulting statistician of the Prudential Insurance Company since 1894, retired from active duty May 1, at the age of 70 years. Dr. Hoffman has written widely on medical subjects as related to insurance. In recent years he has conducted a health survey of the lead using industries, surveys of cancer in Mexico and in Europe and made a study of causes of death in various races. Dr. Hoffman is an Associate Fellow of the American Medical Association, a former president of the American Statistical Association, a director of the American Society for the Control of Cancer and the American Public Health Association, and a charter member of the National Tuberculosis Association. In 1911 Tulane University of Louisiana bestowed on him the honorary degree of doctor of laws.

Pittsburgh

Economics Meeting.—The Allegheny County Medical Society held a special meeting on economics, May 10, with the following speakers: Dr. George W. Grier, Pittsburgh, "Activities of the Committee on Medical Economics"; Francis D. Tyson, Ph.D., professor of economics, University of Pittsburgh, "Health Insurance Under Medical Guidance as a Substitute for State Medicine," and Dr. Arthur C. Christie, Washington, D. C., "Economic Problems of Medicine: Is Health Insurance the Solution?"

TEXAS

New Officers of State Board.—Dr. Joseph Allen Kyle, Houston, was elected president and Dr. William E. Watt, Austin, vice president of the Texas State Board of Medical Examiners at a meeting, April 11. Dr. Thomas J. Crowe, Dallas, was reelected secretary. New members of the board recently appointed by the governor are Drs. Marion M. Brown, Mexia; Herschel F. Connally, Waco, and Oliver B. Kiel, Wichita Falls, and R. H. Peterson, D.O., Wichita Falls.

WISCONSIN

William Snow Miller Lecture.—The eighth William Snow Miller Lecture, sponsored by Phi Beta Pi and the University of Wisconsin Medical Society, was delivered May 2 by Leslie B. Arey, Ph.D., Robert L. Rea professor of anatomy and chairman of the division of anatomy, Northwestern University Medical School, Chicago. His subject was "Factors That Influence the Course of Wound Healing."

Society News.—Drs. Enoch F. Peterson, Wauwatosa, Max J. Fox and Mynie G. Peterman, Milwaukee, presented a symposium on scarlet fever before the Milwaukee County Medical Society, April 12. Dr. Russell L. Haden, Cleveland, delivered the first lecture in a course in laboratory methods and clinical interpretations begun March 21 under the auspices of the society.——Dr. Arthur G. Sullivan, Madison, addressed the Jefferson County Medical Society, March 21, on "Legal Pitfalls in the Practice of Medicine and Their Solution."——Dr. Edwin F. Schneiders, Madison, discussed "Early Diagnosis and Treatment of Cancer of the Breast, Cervix and Uterus" at a meeting of the Richland County Medical Society, March 14.

Health in 1934.—Provisional reports of vital statistics for 1934 issued by the state board of health indicate that the death rate was 9.8 and the birth rate 16.3 per thousand of population. Diseases of the heart and cancer were the leading causes of death, with rates of 227.9 and 119 per hundred thousand, respectively, both increases over the previous year. The rate for tuberculosis, 36.5 per hundred thousand, is the lowest ever shown in the state. The influenza rate, 11.4, was the lowest since 1914, except for 1921; that for diphtheria the second lowest ever recorded, 0.84. The infant death rate was 49.9 and the maternal death rate 4.19 per thousand live births, a slight increase over those for 1933. Deaths from automobile accidents increased from 627 to 695.

ALASKA

Outbreak of Influenza.—The newspapers report an outbreak of 300 cases of influenza at Point Barrow and 200 at Wainwright, with fourteen deaths up to May 7. Dr. Henry W. Greist, medical missionary at Point Barrow, reported that the situation at Point Barrow was under control. Shortage of food, coal and coffins and inadequate hospital facilities complicated the difficulties faced by Dr. Greist, who is said to be the only physician in this area.

GENERAL

Medical Bills in Congress.—*Changes in Status:* S. J. Res. 108 has been reported to the Senate, authorizing an appropriation for the expenses of participation by the United States in the eighth International Congress of Military Medicine and Pharmacy, to be held at Brussels, Belgium, in 1935. S. 2625 has been reported to the Senate, proposing to extend the facilities of the Public Health Service to seamen on government vessels not in the military or naval establishments (Rept. No. 600). H. R. 6625 has been reported to the House, conferring jurisdiction on the United States District Courts over Osage Indian drug and liquor addicts (Rept. No. 740). *Bill Introduced:* H. R. 7939, introduced by Representative Fulmer, South Carolina, proposes to authorize the erection of a veterans' hospital at or near Orangeburg, S. C., for Negro World War veterans.

Subscription Impostor Imprisoned.—Charles W. Cooper, who passed himself off as a representative of the American Medical Association and collected Fellowship dues and subscriptions to THE JOURNAL from a number of physicians in the south, is now serving one year in prison for fraud. He is shown in the accompanying photograph. While Cooper's activities have been definitely stopped, it cannot be too strongly emphasized that all accredited representatives of the American Medical Association carry credentials signed by Dr. Olin West, Secretary and General Manager. A safe rule is to pay no money to strangers. Charles Cooper is an affable appearing, businesslike young man and apparently was clever enough to sidestep the matter of credentials when calling on physicians. Any genuine representative of the American Medical Association will gladly produce credentials when asked to do so.

Society News.—The American Association for the Study of Goiter will hold its annual meeting in Salt Lake City, June 24-26.——The Association for Research in Ophthalmology will hold its annual meeting in Atlantic City at the Marlborough-Blenheim, June 11. Among others, the following will deliver addresses: Drs. Samuel Hanford McKee, Montreal, Canada, on "A Study of the Pneumococcus Group from the Inflamed Conjunctiva and Lacrimal Sac"; William M. James, St. Louis, "Lysozyme Content of Tears"; Theodore L. Terry and Juanita P. Johns, Boston, "Uveal Sarcoma (Malignant Melanoma)," and Adelbert Ames Jr., LL.B., Hanover, N. H., "Aniseikonia—A Factor in the Function of Vision."——Dr. Charles F. Craig, New Orleans, was elected president of the American Academy of Tropical Medicine at a meeting in New York, April 16, and Dr. Richard P. Strong, Boston, vice president. Dr. Earl B. McKinley, Washington, D. C., was reelected secretary. It was decided to hold the annual meetings hereafter in connection with the meetings of the American Society of Tropical Medicine.

News of Epidemics.—The most extensive epidemics of measles in recent years are being reported in many communities. Erie, Pa., had 247 cases of the three-day type of measles reported in the week of April 13-20; 523 cases had been reported in March. The health officer of Williamsport, Pa., reported that 470 homes were quarantined for measles, April 5. About 600 children had had the disease in Easton, Pa., it was reported, April 13. The state of Michigan had 28,000 cases, 2,775 in Detroit, April 13, according to a newspaper account. More than 200 students at Williams College, Williamstown, Mass., a fourth of the student body, were reported to be ill with German measles, May 3. More than 700 children had been affected in an epidemic of measles in Eveleth, Minn., it was said, April 18. In Chicago 1,407 cases were reported in the week of May 1.——Schools closed for the year in Avilla, Ind., April 9, one month early, in an effort to check an epidemic of scarlet fever. In Milwaukee, where scarlet fever has been epidemic for several months, active cases were reduced to 852, it was reported, April 29. Schools were closed during April because of scarlet fever in Libertyville, Ill., Tharptown, Pa., and Urbana, Ohio, newspapers reported. In Minneapolis all children under 7 were quarantined from April 17 to May 5 to curtail the spread of scarlet fever.——Grade schools in Minerva, Ohio, were closed April 8, when two boys were stricken with meningitis; one died. There have been 109 cases of meningitis in Cincinnati since the first of the year; eighteen cases were in the Cincinnati General Hospital, April 10.

Conference on Rheumatic Diseases.—The second annual meeting and the fourth conference of the American Association for the Study and Control of Rheumatic Diseases will be held at Atlantic City, June 10, at the Marlborough-Blenheim, under the presidency of Dr. Ernest E. Irons, Chicago. The morning will be devoted to a consideration of chronic arthritis and the afternoon to rheumatic fever. The following physicians will participate:

Russell L. Haden and Robert A. Warren, Cleveland, Accelerating Factors in Chronic Degenerative Arthritis.

John S. Coulter, Chicago, Home Treatment of Chronic Arthritis by Physiotherapy.

Russell L. Cecil, New York, Malarial Therapy in Rheumatoid Arthritis.

Philip S. Hench, Rochester, Minn., Results of Fever Therapy for Gonorrheal Arthritis, Chronic Infectious (Atrophic) Arthritis, and Other Forms of "Rheumatism."

Albert B. Ferguson, Haig H. Kasabach and George Douglas L. Taylor, New York, Further Studies on the Roentgenologic Findings in Various Forms of Chronic Arthritis.

Byron D. Bowen and Louis Maxwell Lockie, Buffalo, Chronic Atrophic Arthritis: Effect of High Carbohydrate Diet and Insulin on Symptoms and Respiratory Metabolism.

Edward F. Hartung, New York, Treatment of Rheumatoid Arthritis with Leukocyte Cream.

Readie Garfield Snyder, Cornelius H. Traeger and Carl A. Zoll, New York, Use of Cinchophen and Its Derivatives in the Treatment of Chronic Arthritis.

Homer F. Swift, New York, The Nature of Rheumatic Fever.

Morse J. Shapiro, Minneapolis, The Natural History of Childhood Rheumatism in Minnesota.

Martin H. Dawson and Terence L. Tyson Jr., New York, Relationship Between Rheumatic Fever and Rheumatoid Arthritis.

Currier McEwen, New York, Cytologic Studies on Subcutaneous Nodules in Rheumatic Fever and Rheumatoid Arthritis.

Edward Sterling Nichol, Miami, Fla., The Geographical Distribution of Rheumatic Fever and Rheumatic Heart Disease in the United States.

James F. Rinehart, San Francisco, Studies Relating to Vitamin C Deficiency in Rheumatic Fever.

Albert D. Kaiser, Rochester, N. Y., Influence of the Tonsils on Rheumatic Infection in Children.

Hugh McCulloch, St. Louis, Institutional Provisions for the Care of the Rheumatic Child.

Lucy Du Bois Porter Sutton and Katharine G. Dodge, New York, Fever Therapy in Chorea.

FOREIGN

Congress on Medical History.—The tenth International Congress of the History of Medicine will be held in Madrid, September 23-29, under the presidency of Prof. Gregor Marañon. Subjects for discussion will be Arab medicine in Spain, medicine in America during its discovery and colonization, and medical folklore in civilized countries. All who wish to collaborate are asked to send abstracts of their communications before June 1 to the office of the secretary of the congress, Palacio de la Academia Nacional de Medicina, Calle de Arieta, 12, Madrid. An exhibit of rare and curious books by Spanish and Spanish-American authors is being organized.

Scholarships at Forlanini Institute.—The Italian Fascist National Federation Against Tuberculosis has placed at the disposal of the International Union Against Tuberculosis six scholarships for foreign medical practitioners at the Carlo Forlanini Institute in Rome. The scholarships, which have a value of 3,000 lire plus board and lodging, will preferably be awarded to young physicians already familiar with problems of tuberculosis. The period of study will be from November 15 to July 15, 1936, the academic year. Candidates from the United States must apply through the National Tuberculosis Association, 50 West Fiftieth Street, New York, before June 1.

International Neurologic Congress.—Plans for the second International Neurological Congress in London, July 29-August 2, have been announced. The American delegation will leave New York on the S. S. *Manhattan* July 17, to arrive in London July 23. According to the program, Drs. Stanley Cobb, Boston, and Wilder G. Penfield, Montreal, will take part in a symposium on the epilepsies; Dr. Lewis H. Weed, Baltimore, in one on the physiology and pathology of the cerebrospinal fluid, and Dr. Harvey Cushing, New Haven, Conn., in one on the hypothalamus and cerebral representation of the autonomic system. Sessions for miscellaneous papers will be held in addition to the symposiums. The triennial Hughlings Jackson Memorial Lecture will be presented by Prof. Otfried Foerster, professor of neurology, University of Breslau, Friday evening, August 2. Social affairs will include receptions given by the Royal College of Physicians, the Royal College of Surgeons and the section of neurology of the Royal Society of Medicine. Dr. Henry Alsop Riley, 117 East Seventy-Second Street, New York, is secretary for the United States.

Foreign Letters

LONDON

(From Our Regular Correspondent)

April 20, 1935.

Effect of Unemployment on Health Insurance Finance

At the annual dinner of the National Federation of Employees' Approved Societies, Mr. Edgar Hackforth, deputy controller of the insurance department in the ministry of health, said that employers in this country were not so severely handicapped as they were some years ago by their expenditure on social services, because some of their foreign competitors had followed their example by introducing social schemes. The effect of unemployment on the health insurance scheme was their most important problem and they had not yet solved it. Unemployment diminishes contributions and increases expenditures on benefits. At the end of the year, if the law remained as it was, a considerable number of insured persons would find themselves losing not only all their health insurance title to benefit but also their title to pensions, simply because they happened to have a prolonged period of unemployment. As regards loss of pension rights, something like 200,000 persons might be affected, and as regards health insurance the number would be much higher. He was referring to old age pensions and does not mean that these persons will lose them entirely, but they lose the right of the pension beginning at 65, which insured persons have, while for others the pension begins at 70. There were over 5,000,000 insured persons in this country, who, because they had been unemployed for more than four weeks in the year, were in the position of having their health insurance benefit subjected to a reduction in the following year unless something special was done for them. The department had done all that it could under the finances of the present scheme, but it had to face the problem whether it was possible to return to the basis of the act of 1928, by which all the arrears due to unemployment could be excused. That was a difficult problem. It was satisfactory that 1934 did show a marked improvement in the general finance of working the insurance. Employment improved and was accompanied by a material fall in expenditure on sickness and disablement benefits. At the annual meeting of the federation, the president asked why there should not be included in the benefits to which an insured person is entitled under the unemployment insurance acts some provision against his liability for the contribution required to keep him in benefit for health and pension insurance. This arrangement had worked for many years in Germany, where 170,000 had dropped completely out of insurance and become a charge on public assistance during ill health.

British Memorial to Madame Curie

A banquet in support of a British memorial to Madame Curie was held in London. The purpose was to raise $250,000 for the endowment and extension of the Marie Curie Hospital of London. Mr. Neville Chamberlain, who took the chair, said that he had been asked to do so because of his long association with the ministry of health. He paid "a humble tribute to a very great woman, a most original and fertile investigator, and one of the great benefactors of the human race." To the toast to her memory her daughter Mlle. Eva Curie, a well known musician, responded. She said that her mother often said that "in science we should be interested in things, not persons." She meant that her own person was of no importance compared with the things to which she devoted her life. A discovery made by any scientist gave her as sincere joy as a discovery of her own. The burden of celebrity overwhelmed her, and at the end of her life she still said "I am nothing but a student." All the passion that she scorned to devote to seeking honors she devoted to helping those in need of her. During the war she drove x-ray cars along the French and Belgian fronts and carried out roentgen examinations of thousands of wounded; her postwar activities were devoted to the practical development of radium therapy. The physicist Sir William Bragg spoke of the eminence of Madame Curie in physics and the difficulty and hardship of the conditions under which her discoveries were made—in a building with an asphalt floor and a glass roof, by no means proof against the rain, a hothouse in summer, and in winter scarcely warmed by a single stove, with furniture consisting of old tables on which the specimens were deposited. But, she wrote, "I shall never forget the ravishing joy we used to have on coming home at night when we saw the faintly luminous shapes of the products of our toil."

Pay Patients in the Voluntary Hospitals

A bill to enable hospitals to provide pay beds, provided it is not done at the expense of ordinary beds, was read a second time in the house of lords. Patients in the pay beds would be those whom a hospital almoner would not usually accept in the ordinary wards but who could not afford the cost of private treatment in their homes and urgently required the assistance of a hospital with all its specialist treatment. Such patients are sometimes called "the black-coated poor." Some voluntary hospitals have already done this, but they have had to obtain a private act of parliament, which costs at least $2,500. Some misgiving was expressed by the labor party in the house as to whether the bill would cut down the services for poor people, as the hospitals had long waiting lists. The labor party was dissatisfied with the hospital system and wanted all the hospitals to be taken over by the municipalities, publicly controlled for the free treatment of all who needed it. It was not right that the great health services which the hospitals provided should be supported by costly banquets, balls, bazars, fêtes and flag days, and inadequately supported at that. For the government, Viscount Hailsham said that a case was made out of the desirability of having some beds available for the class that was willing to make some payment toward the expense of treatment but was unable to afford the fees of a nursing home. But there should be safeguards to ensure that the funds settled on it for the benefit of the sick poor were not diverted for any other purpose.

Overcrowding of the Medical Profession

During 1934 the names added to the British Medical Register amounted to 1,664, and 898 were removed by death and a small number by other causes, giving a net increase of 755, which brings the total number on the register up to 57,496. This figure may be compared with 44,761 in 1920 and 40,483 in 1910. In 1934 the number of medical students who registered was 2,350, a number without parallel save for the exceptional years of 1919 and 1920 following the war. Thus Great Britain is no exception to the overcrowding of the medical profession reported in other European countries, though this has not yet attracted attention here. Complaint of overcrowding has been made also in Australia. No cause has so far been assigned for the increase in Great Britain beyond a suggestion that there has been a considerable expansion in recent years of the public medical services. A more probable and a regrettable cause is the great difficulty of the rising generation in the class from which medical students come in obtaining employment of any kind in this period of unprecedented industrial depression.

Objections to the Sterilization of Defectives

In an address to the Manchester and Salford branch of the National Council of Women, Dr. Charles Rankin, a psychiatrist, urged the need of caution before coming to conclusions on the sterilization of mental defectives. The recent report of the committee appointed by the government had recommended the legalization of voluntary sterilization in persons suffering

from hereditary forms of mental disorder or defect or from grave heredity forms of physical debility. Dr. Rankin doubted whether these were scientific recommendations. Half the mental deficiency was due not to hereditary but to environmental causes, yet on the latter the committee had little to say. It admitted the need for research into hereditary factors in mental and physical disability. He believed that of no mental disorder was the exact nature of the inheritance known. All that was known was that inheritance proceeded through mendelian laws. No doubt heredity was a factor, but the question was as to its assessment compared with racial poisons, such as tuberculosis, syphilis and alcohol. Only a small proportion of defectives had definitely certifiable parents. He also objected to sterilization on moral grounds, as it would encourage irresponsibility in sex behavior and the propagation of venereal disease. Against these arguments it could be urged that, although the part played by heredity in mental deficiency cannot at present be exactly assessed, it cannot be questioned that sterilization of mental defectives would do something to reduce the incidence of the condition in our population.

PARIS

(From Our Regular Correspondent)

April 12, 1935.

The Primary Tuberculous Focus in Adults

An examination of all first year students at the University of Strasbourg was begun in 1929 by Vaucher, Strauss and Schneegans. It comprises a complete physical examination, including roentgenoscopy and, in suggestive cases, films of the chest, together with an examination of the nose, throat, ear and teeth. The observations in regard to tuberculosis were the subject of a paper read at the Dec. 14, 1934, meeting of the Société médicale des hôpitaux de Paris. Thirty-five cases of active pulmonary tuberculosis were discovered in the examination of 1,343 students. Twenty-five of the thirty-five students were unaware of the presence of any pulmonary lesion.

During 1931-1932 skin reactions were used in 232 cases, of which sixty were negative but of which three became positive shortly afterward. Another cutaneous and then an intradermal test was made of forty-one students whose primary reaction had been negative. Of these forty-one the later tests were positive in eleven, negative in twenty-five and doubtful in five. Emphasis is laid on this observation, which teaches that, if one had been content with a single skin test, more than 30 per cent would have been found negative. If a cutaneous test is negative, a second, preferably an intradermal test, should be made later.

Five cases were reported in which the skin reaction was negative. In the first student, a girl of 18, the skin reaction was negative in 1932 but she showed evidences of a serofibrinous pleuritic exudate and a large lymph node at the hilus of the right lung as the first sign of tuberculosis. In a second case, two skin reactions at intervals of fifteen days were negative. This patient was serving as an extern in a tuberculosis ward. Four months later, signs of a left dry pleurisy appeared. Roentgenography revealed a bilateral adenopathy in both pulmonary hili. In the third observation, two skin tests and one intradermal reaction were negative in a girl student in 1932. A year later, when clinical work was begun, fatigue and loss of weight led to a roentgenographic examination, which revealed discrete pulmonary nodular lesions in both apexes. Two other cases were reported in which the tuberculous infection was apparently primary in adolescence, with involvement of the hilar lymph nodes as the first evidence.

In the majority of cases there is absence of any clinical symptom of tuberculous infection. In several students the skin reaction became positive as soon as ward work was begun, but even in these cases there were no clinical signs. In some apparently primary cases in young people, the infection begins as an acute caseating lesion. Another clinical form is that in which, at the onset, there is a more or less prolonged febrile period without any accompanying clinical manifestation. This is the typhoid-like form of tuberculous infection, which is often diagnosed as influenza or intestinal infection. This was true of three of the five cases reported in which, a little later, evidence of lymph node involvement (at the hili) or a dry or exudative form of pleuritis appeared.

Nico in his thesis has reviewed the literature of primary tuberculous infection and has found that a serofibrinous pleuritic exudate is commonly the first clinical sign that attracts attention. Such a pleurisy is, of course, secondary. Skin reactions should be regularly employed in young students and soldiers, especially in medical students and nurses. When the skin reaction is negative, the individuals should be cautioned against exposing themselves to cases of pulmonary tuberculosis. Students who have a negative skin reaction should be vaccinated with the B C G vaccine and clinical work should not be permitted until five weeks later.

Rist, in the discussion, stated that his experience with a large number of students confirms that of Vaucher and his associates and that of foreign clinicians, especially Myers of the University of Minnesota. Those students who have a negative skin reaction should be kept under observation. Every student in the Paris medical school is obliged to have such a skin test made at the time of matriculation. It would be well to add a roentgenographic examination, such as is carried out at Strasbourg.

Methods of Resuscitation in Asphyxia

At the Dec. 4, 1934, meeting of the Academy of Medicine, Nicloux and Legendre stated that only too often the one who is trying to save a life becomes a victim. A drowning person ought to be approached only from behind and held by the back of the head. The first duty in cases of asphyxia is to try to ventilate the room before any attempt is made to remove the asphyxiated person. In the case of ditches or mine galleries the life saver should never enter unless a rope keeps him in touch with some one in the free air, so that he can be pulled out. In trying to remove any one from high tension wires, one is interfered with by wet soil, shoes or feet; hence one should try to find a nonconductor in the shape of a board, chair or stool and to use only one hand in detaching the victim.

In France, two methods of artificial respiration, the Silvester (raising the arms at regular intervals) and the Laborde (rhythmic tongue traction) have been abandoned in favor of the Schafer method. An apparatus devised by Dr. Panis acts automatically to carry out the Schafer method and is extensively used in Paris.

Artificial respiration must be kept up, whether by the Schafer method or by some such apparatus, for a long time, even for hours. The only adjuvants to artificial respiration are maintenance of the body heat of the victim (especially in cases of drowning) and the inhalation of oxygen.

Carbon dioxide is not of much help in the dissociation of the carboxyhemoglobin in cases of gas asphyxia, whereas oxygen will be of assistance.

At the January 22 meeting of the Academy of Medicine, Cot and his associates discussed the same subject. The Schafer method has been employed exclusively since 1924 by the Paris fire department. The hands are applied at the base of the thorax, the victim lying face downward. As much pressure as possible is applied to provoke expiration, no pressure being used during inspiration. The theory of this method (Schafer) is to stimulate the diaphragmatic reflex. It is far less fatiguing to apply than the Silvester or the Laborde method. Pulmotors do more harm than good. The insufflation of air under pressure only increases the already existing pulmonary congestion

and edema. Brickley is quoted as having found tears and hemorrhages following the use of this method in animals.

The only forms of apparatus that are of help apply force externally to stimulate respiration. The authors have devised such an apparatus, which is designed to imitate the movements employed in the Schafer method. In 1934, 75 per cent of the victims of asphyxia from illuminating gas and charcoal fumes were resuscitated, but only 60.2 per cent of the victims of drowning. The Cot apparatus was the only method of artificial respiration employed in the last eight months of 1934.

Roentgenographic Diagnosis and Treatment of Intussusception

In a recent article Pouliquen of Brest states that until lately the diagnosis of intussusception in infants was based on the triad colics, vomiting and bloody stools. At present the most valuable method of diagnosis, and occasionally of reduction, is the barium sulphate enema under fluoroscopic control. This should be employed as early as possible and, if it reveals inability to reduce the intussusception, operative treatment must follow immediately. The barium enema may occasionally be successful in the reduction of the invagination, 200 Gm. of barium sulphate to a liter (quart) of water suffices, and one can safely raise the irrigator to a height of 4 feet (120 cm.) or even a few inches higher in early cases. With the exception of the left colocolic and transverse colon forms, the mass can be easily pushed over to the right iliac fossa, where one has an opportunity to observe whether the barium enema enters the ileum freely, which is the sole criterion of a successful nonoperative reduction.

If only a few irregular shadows or streaks are seen in the ileum, the attempt at reduction by the barium enema must be regarded as having been unsuccessful. If, however, the barium has passed in large amounts into the lower ileum and one can no longer feel the invagination, reduction has been successful. It is necessary to keep in mind the possibility of a double invagination, as two cases recently reported by Bloch and Duroselle show. The only criticisms against nonoperative reduction under fluoroscopic control are that one cannot prevent a recurrence by fixation of the intestine. The indication for such an operation is rarely present and it should be employed only in recurrent cases. Another objection is that there may be an accompanying acute appendicitis, but this is rare, especially in the first year of life. A case of rupture of the intestine has been reported by Fèvre, but this was in an advanced, inoperable case. The most important argument against nonoperative reduction is, then, the danger of recurrence. Pouliquen has had a large experience and has observed only one such case. Reduction by a barium enema will be successful in at least 60 per cent of the cases. The ileocolic form is the least favorable for nonoperative reduction. If vomiting or the inability to pass flatus or feces persists, the roentgenoscopic examination can be repeated in a few hours and an operation performed at once. A right lateral incision is to be preferred and every effort should be made to reduce the invagination because the prognosis is very unfavorable in cases in which resection is unavoidable.

Search for Bacteriophage in Water Supplies

At a recent meeting of the Academy of Medicine, Dr. M. F. Dienert discussed the necessity of a routine examination of sources of water supply and discharge, for the presence of bacteriophages. The excreta of patients suffering from any form of intestinal infection always contain a bacteriophage. This ultravirus is transported into the sewers and from them into the adjacent rivers. Gildemeister and Watanabe have found an increase of bacteriophage in the river Spree (Berlin) five days after a rainfall. Dienert has observed an increase in the amount of the anti-Eberth bacillus or antiparatyphoid A or B bacteriophage in the Seine, into which the waste of Paris drains, whenever there had been patients either in the acute stage of typhoid or convalescing from an attack. The bacteriophage remains viable much longer, six months for example, in water or in the soil, than the typhoid or paratyphoid organisms. For this reason one ought systematically to search for bacteriophage in the waters into which a city discharges its waste, in order to trace cases of typhoid which have either not been reported or in which the excreta have been inadequately disinfected.

BERLIN

(From Our Regular Correspondent)

March 11, 1935.

The Mortality from Various Diseases

In 1934 the mortality from the infectious diseases of childhood was 29.4 per cent greater than in the previous year. As in 1933, the mortality rates for measles, scarlet fever and whooping cough were highest in the first quarter, and for diphtheria in the last quarter.

The number of infant deaths from syphilis in 1934 was 0.36 per thousand, which denotes a further decrease over 1933 (0.45 per thousand). This mortality was greatest in the cities on the Rhine and the Main, and in the seaports. Because of the sustained high summer temperatures, the infant deaths from intestinal catarrh increased (from 4.8 to 5.1).

Table 1 shows the number of deaths in 1934 from the diseases of the more advanced years, and the deaths for 10,000 of population during the period 1930-1934.

TABLE 1.—*Deaths in 1934 from Diseases of Advanced Years; Deaths for 10,000 of Population, 1930-1934*

	Total Deaths in 1934	Deaths for 10,000 of Population in 1930	1931	1932	1933	1934
Cancer and other malignant growths	29,427	13.8	14.5	14.5	14.7	14.9
Apoplexy	18,791	8.0	8.3	8.6	9.2	9.5
Diabetes	3,840	...	1.7	1.9	2.0	1.9
Senile debility	10,155	4.6	5.1	5.3	5.6	5.1

It appears that the deaths from malignant growths and from apoplexy show an increase, but no greater increase than the increased representation of the older age groups would lead one to expect. The decreased mortality from senile debility is doubtless due to the fact that in 1934 there was no pronounced influenza epidemic such as occurred in 1933.

Table 2 shows the number of deaths in 1934 from other important diseases.

TABLE 2.—*Deaths in 1934 from Other Important Diseases; Deaths for 10,000 of Population, 1930-1934*

	Total Deaths in 1934	Deaths for 10,000 of Population in 1930	1931	1932	1933	1934
Cardiac diseases	27,490	13.3	12.8	13.0	14.0	13.9
Tuberculosis	14,246	8.1	8.1	7.5	7.5	7.2
Pneumonia	13,078	7.1	7.5	6.3	7.0	6.6
Nephritis	4,033	...	2.2	2.1	2.0	2.0
Bronchitis	2,405	...	1.6	1.4	1.6	1.2
Influenza	1,624	0.7	1.8	0.8	2.9	0.8
Typhoid	148	0.09	0.06	0.08	0.07	0.07
Cerebrospinal meningitis	122	0.08	0.08	0.06	0.06	0.06
Encephalitis	63	0.03	0.04	0.02	0.02	0.03

The number of deaths from puerperal fever showed, because of the greatly increased number of births, the greatest increase of any cause of death (39.7 per cent higher than in 1933), whereas the other accidents of pregnancy and of childbirth showed a much smaller increase (8.7 per cent). The deaths from puerperal fever following miscarriage show a marked decrease; namely, 13.0 per cent.

The deaths due to violence and accidents during the period 1929-1934 are outlined in table 3.

TABLE 3.—*Deaths Due to Violence and Accidents, 1929-1934*

	1929	1930	1931	1932	1933	1934	1934 in Percentage Relation to 1933
Suicide	5,368	6,297	6,346	6,497	6,335	6,032	95.2
Murder and manslaughter	295	358	360	395	382	273	71.5
Accidents	6,436	6,314	5,628	5,723	5,035	5,589	111.0

Non-Aryans in Panel Practice

The federal minister of labor, who is competent to answer all questions pertaining to the health insurance societies, stated recently, in response to an inquiry, that there were no objections to the preparation of lists of panel physicians, differentiated according to Aryans and non-Aryans, for the use of the krankenkassen. It was well known that the krankenkassen had such lists, and there may be said to be need for them in order that the insured may be given information in response to inquiries concerning the racial origin of a panel physician. It was not important whether the krankenkassen prepared such lists or whether they secured them from the Kassenärztliche Vereinigung Deutschlands. This attitude is significant for forming a judgment in regard to the situation; for the non-Aryan physicians admitted to panel practice are either those who were admitted before the war or who were admitted because they fought at the front. It was for the benefit of the latter class that the special privileges were created.

In the recent regulations for admission of students to medical examinations is found this new provision: "Admission to the examinations and the granting of a license to practice presuppose the furnishing of proof of Aryan origin (birth certificate of the candidate, birth certificates and marriage licenses of the parents and of the grandparents on both sides)." The same requirements apply to candidates for the diploma of dentist. This corresponds to the attitude that the Berlin rector announced some months ago (THE JOURNAL, March 3, 1934, p. 710).

Admission to Dental Practice

Little has been heard of late about the question of extending the privileges and the medical activities of the nature cure doctors. If any progress in this direction has been made, it has not been announced. Doubtless the opposition has proved to be greater than was anticipated. On the other hand, an old demand of the dental technicians has been granted. In place of the term dental technician, which in German usage plainly designates the limited training of such persons in comparison with the academically trained dental physicians, the federal minister of labor has substituted the term "dentist." At the Berlin Lehrinstitut für Dentisten, persons without means are supplied with prostheses free of charge. April 1 there will be opened in Düsseldorf one of the seven dental schools to be created throughout the reich, and it promises to be the most modern school for dental technicians in Germany. The director will be a dental technician, or "dentist," and not a *zahnarzt*, or dental physician. Both dental physicians and dental technicians must be entered in a register before they are admitted to practice. According to a recent decree, an applicant will not be admitted unless he and his wife are of Aryan origin. The previous exception, according to which front line combatants, including the fathers and sons of persons who died in the World War, were admitted even though of non-Aryan origin, has been abolished. This makes the application of the regulations much more severe and works a hardship on the sons of men who died in the war, who, relying on the previous exceptional privilege, have already partially completed their course in dentistry. Furthermore, a license to practice already granted will be withdrawn if an Aryan dental physician or "dentist" admitted to panel practice marries a woman of non-Aryan origin or has married such a woman since July 1, 1933.

A system of relief, organized by the dental physicians and supported in part by the federal government, has been created in the sections of Röhn and Spessart, two high plateau regions of Germany that have suffered severely from the economic crisis. Four Berlin dental physicians with four woman assistants have treated, during the past few months, more than 1,500 children gratis in this area. It is planned to give dental aid to about 8,000 children.

Boric Acid in Remedies for Obesity

The federal bureau of health has called attention to obesity remedies containing boric acid and borax, which are injurious to health. In recent years obesity remedies containing boric acid, free or in combination with other substances, have been put on the market. Boric acid and borax, if taken in quantities of more than a fraction of a gram, are not harmless substances. The public should inquire whether the preparations contain any boric acid.

Similar observations in Denmark led to the recent order that obesity remedies may not contain boric acid or its salts.

A Central Cancer Institute

In the Rudolf Virchow-Krankenhaus in Berlin a central cancer institute that is to serve all northern Germany is to be created. It will be both a therapeutic and a research center. As the first step, a large committee has been appointed, on which, among others, the whole Berlin faculty of medicine will serve, Professor Sauerbruch being the chairman. For this institute, which is to be directed by Professors Cramer and Hintze, a suite of rooms with 300 beds, in the aforementioned hospital, has been selected.

BUENOS AIRES

(From Our Regular Correspondent)

March 1, 1935.

Cancerigenic Action of Sunlight

Dr. A. H. Roffo has succeeded in producing cutaneous cancer in the face and ears of white rats by repeated exposure of the animals to sunlight. From these results of experiments, he believes that sunlight baths have a cancerigenic action. His statement has encountered many objections, because: 1. A reasonable and well controlled exposure of children and young adults to sunlight produces a beneficial action on their health. 2. Sunlight is helpful in the treatment of tuberculosis of the bone and of surgical tuberculosis. 3. Cutaneous cancer does not develop frequently in bovine, equine and other animals that are exposed to sunlight the year round.

Quinoa Seeds as Food

The seeds of quinoa (Chenopodium quinoa) were used as a food by the Incas and are still used as such in Peru, Bolivia and the northern regions of Argentina. Dr. P. Mazzocco made a study of their alimentary value and found that the protein content of quinoa seeds is sufficient. They contain also vitamin B and are an excellent food if associated with cereals that contain vitamins A, C and D, the content of which is insufficient in quinoa seeds.

Early Diagnosis of Cancer

Special departments for the diagnosis of tumor tissues, removed by a biopsy, have been organized or are in organization in several municipal hospitals of Buenos Aires, having as an aim the early diagnosis of cancer and early treatment. Drs. Mosto and Brachetto-Brian are directors of the departments in the Rawson and Durand hospitals, respectively.

Pan-American Health Conference

The ninth Pan-American Health Conference was held at Buenos Aires, Nov. 12-22, 1934, by representatives from all countries of North and South America. All the suggestions made by the North American delegation, formed by Drs. Cumming, Lloyd, Long and Emerson, met with the general approval of the attendants. The following motions were made: Adoption of the international health convention for air navigation (The Hague); ratification of the resolutions taken at the International Health Convention held in Paris in 1926; a decennial census of the population; unification of the departments of public beneficence and welfare, both public and private, under one authority; organization of aviation; continuation of the studies on typhus and yellow fever. Dr. F. L. Soper of the Rockefeller Foundation read a paper on yellow fever in South America. He proved that there are foci of endemic yellow fever in certain regions of South America where there are no mosquitoes and that the transmitting agent is unknown in these cases. In connection with his article the following motions were made: 1. To carry on studies on the protective power of antiserum. 2. To investigate the frequency of yellow fever by the performance of microscopic studies of the liver of cadavers of persons who died within ten days of the onset of a febrile disease. In these cases the pieces of liver should be taken by biopsy with a special viscerotome. 3. The organization of antilarval work in ports and air ports where the presence of Stegomyia has been established. 4. Preventive vaccination of those who are in possible contact with infected cases. 5. Organization of special laboratories for work on yellow fever. Cooperation of the pharmacopeial committees of North and South American countries tending to the establishment of a unified pharmacopeia for both continents was advised. Resolutions to intensify the campaigns against tuberculosis, uncinariasis, leprosy, malaria, plague, brucelliasis, venereal diseases, alcoholism and narcotism were adopted.

Personal Items

Dr. Alfredo Sordelli, director of the Instituto bacteriológico nacional, has been appointed a member of the Committee of Biologic Standardization of the Society of the Nations and a corresponding member of the Societé de biologie of Paris.

Dr. B. A. Houssay has been appointed a corresponding member of the Académie de médecine of Paris, an honorary member of the Academia de medicina of Madrid, and an honorary fellow of the Royal Society of Edinburgh.

Dr. J. Bacigalupo has been appointed a corresponding member of the Societé de pathologie exotique of Paris.

Dr. Avelino Gutierrez has been appointed an honorary member of the Academia de medicina of Madrid.

Dr. R. Araya of Rosario was awarded the Saintour prize by the Académie de médecine of Paris for his work on ovulation and menstruation. Dr. Araya states in his article that there is no relation between the phenomena of ovulation and menstruation.

Dr. J. C. Ahumada has been appointed professor of gynecology at the Faculty of Medicine of Buenos Aires.

Drs. Foz and Baraldi have been appointed professors of psychiatrics and surgery, respectively, at the Faculty of Medicine of Rosario.

Dr. Oscar Orías has been appointed full time professor of physiology at the Faculty of Medicine of Córdoba.

Drs. F. Bottazzi of Naples, L. Brauer of Hamburg, L. Binet of Paris and C. Monge of Lima were appointed honorary academicians to the Academia Nacional de Medicina of Buenos Aires. Drs. L. Surraco of Montevideo and García Otero of Montevideo were appointed correspondent academicians of the same society.

Dr. R. Bullrich has been appointed honorary professor of the Faculty of Medicine of Montevideo.

NETHERLANDS

(From Our Regular Correspondent)

March 6, 1935.

The Congress of Neurology and Psychiatry

The twelfth Congrès belge de neurologie et de psychiatrie was to have been held in Belgium; but the Netherlands Neurologic and Psychiatric Society conceived the idea of merging the congresses of the two societies and of holding the joint session this year in Amsterdam.

The first paper dealt with "The Neuro-Anemias" and was presented by Professor Van Genuchten. The neuro-anemic syndrome is the disorder that is encountered most frequently after tabes and multiple sclerosis. The characteristic lesion of neuro-anemia is the vacuolar degeneration of the white substance. The formation of vacuoles is due to the combined involvement of the axis cylinder and the myelin sheath. This lesion is not pathognomonic of the neuro-anemic syndromes. The localization of the lesions in the nervous system has not been fully explained; possibly it is conditioned by the vascular topography. The gray substance is less changed but does not completely escape involvement (chromolysis, masses of pigment in the cells, and the like). Pernicious anemia and the neuro-anemic syndromes are deficiency disorders. Normally the factor that prevents pernicious anemia is found in the gastric juice. In case of an insufficiency of this factor, grave symptoms arise in the organism, which, it is believed, are attributable to a disturbance of lipoid metabolism.

Among the other communications an experimental contribution on "The Clinical Characters of Parkinsonian Trembling" may be mentioned, by René Nyssen and René Dellaert. Their results may be summarized thus: A distinction must be made between the results secured in senile patients and those furnished by encephalitic patients. In the former, the mode of reaction is almost constant, whereas in the latter modifications in the trembling vary from case to case. In the same senile patients the trembling increases in the nonactive members. The results secured in senile patients through the tests of mental effort and of emotions likewise confirm the conceptions of Kleist, Jong and Froment in that one accords to these states a significance opposed to that of repose. As regards encephalitic patients, in view of the difference in the reactions in various cases, neither of the two general conceptions can be maintained with respect to either the member in motion or the symmetrical member. What has just been said in regard to encephalitic patients is particularly frank and striking in arteriosclerotic parkinsonism. Two other facts to be noted are: (*a*) the frequent and sometimes very marked dyschronism between the hand and the foot, in both the senile and the encephalitic patients; (*b*) acceleration of the trembling, which constitutes an almost constant reaction under the influence of the different factors considered.

Mode of Infection in Weil's Disease

It is generally recognized that there is more than one way in which Leptospira icterohaemorrhagiae gains entrance to the human organism from water: through the skin (particularly if the skin is broken), or through the mucosae. In the *Nederlandsch Tydschrift voor Geneeskunde*, Dr. Van Thiel emphasizes the significance of infection through drinking water, particularly through the nasal and buccal mucosae.

The author performed a series of experiments on the guinea-pig and the rat, the results of which he reported in detail. Although the possibility of an infection by mouth was confirmed, several million pathogenic organisms may be swallowed by the animal without any infection developing. Infection is brought about much more easily through the nasal mucosae, the conjunctivae or the lacrimal canal. The author concludes from this fact that the water snuffed up the nose by swimmers constitutes an especially grave danger.

MOSCOW

(From Our Regular Correspondent)

April 2, 1935.

Report on the Public Health

At the sixteenth All-Russian Congress of Soviets in Moscow, January 6-16, a report of the People's Commissariat for Health was read. The following data presented before the congress shows the progress in the field of public health:

Changes Between 1913 and 1934

	1913	1934
Number of hospitals	780	1,745
Number of hospital beds*	103,000	318,000
Obstetric beds	5,500	32,000
Health points in industrial plants	3,300†	4,300
Polyclinics	880	2,500
Tuberculosis dispensaries	43	416
Physicians	About 15,000	53,000

* Except beds for mental patients.
† Health points in 1913 were given by first aid ambulance doctors, by physician's assistants. Now they represent well equipped polyclinics in plants and manufactories.

Changes Between 1928-1929 and 1934

	1928-1929	1934
Number of public nurseries in towns	772	3,336
Number of places in permanent country public nurseries	7,500	350,000
Number of places in summer country public nurseries	115,000	3,200,000
Number of workers who visited health resorts and spas	518,000	1,500,000

In 1929 there were sixteen medical high schools with 15,000 students; in 1934 the number of medical students was 50,000 and the number of medical high schools was 31. In this number are included five medical high schools working with large hospitals. For building and equipping these medical establishments, 6,400,000 rubles was assigned in 1933 and 38,000,000 rubles in 1935. Up to the present time 40 per cent of the hospitals and 35 per cent of the polyclinics and ambulatoriums have their own rooms for physical therapy, x-ray equipment and clinical laboratories.

The scientific work is done in thirty-three central and 154 outlying investigation institutes of the People's Commissariat for Health. Scientific work is carried on in all medical high schools.

Increased Appropriation for Public Health

The government has decided to assign 370 million rubles to increase the wages of medical workers. Physicians who have scientific degrees will receive increased wages. This increase in wages concerns also middle and junior medical workers, dentists and chemists. The wages of medical workers in the outlying districts are increased from 10 to 20 per cent, depending on what work they are doing. The increase of wages for workers occupied in the extreme north of the country is 50 per cent. To improve the food for hospital patients, the daily ration is increased in towns from 1 ruble 75 copecks to 2 rubles 80 copecks and in the country from 1 ruble 30 copecks to 2 rubles.

This decision, published March 5, is signed by the president of Sovnarkom (Council of People's Commissariat), Vladimir M. Molotov, and the general secretary of the Central Committee of the All Russian Communist Party (bolshevik), I. V. Stalin.

The Campaign Against Malaria

The laboratories of the Academy of Science of the Union of Socialist Soviet Republics in April 1933 produced the preparation "acrichin" (which is identical to the German preparation "atabrine") and gave it to the Tropical Institute of the People's Commissariat for Health, where clinical trials made on several thousand patients have shown that acrichin has great therapeutic activity. The dose required for complete recovery from malaria is much less than that of some other preparations. It is much less bitter and does not cause ringing in the ears. The government will build two factories for making acrichin.

To establish an international plan for testing synthetic antimalaria preparations, a commission of the hygienic committee of the League of Nations was summoned at Moscow, February 20, under the presidency of Professor Sergent (director of the Pasteur Institute at Algiers). The members of the commission were Professor Chooka of Rumania, Dr. Hackett of the Rockefeller Foundation, Dr. Annigstein of Poland, Dr. Lega of Italy, Dr. Pampana, secretary of the malaria committee of the League of Nations, and Soviet scientists. After the meeting the members of the commission went to Gorki (former Nizhni-Novgorod), where they became acquainted with the mass application of acrichin at Sormovo, a suburb of Gorki. The commissioners decided to organize a comparative study of the action of synthetic antimalarial preparations for prophylactic and curative purposes in the Soviet Union, Algiers, Italy and Rumania.

Vitamin C in Conifer Needles

The Leningrad Scientific Institute of Nutrition has discovered that the antiscorbutic vitamin C is not only found in foodstuffs but is present in the leaves of red currants, cabbage and the needles of conifers. Out of 1 Kg. of conifer needles a concentrate has been obtained sufficient to protect a man for a month from scurvy.

The institute has set up apparatus for manufacturing concentrates of vitamin C out of cabbage leaves and conifer needles and at present is using daily 100 Kg. of conifer needles. This is the first factory to produce vitamins in the Soviet Union. It is of great importance because now all the northern parts of the country as well as the expeditions to the far north will be completely protected from scurvy.

Medical Congresses in 1935

This year there will be held thirty-five conferences, meetings and congresses instead of the four that took place last year. In Moscow the All-Russian meeting on Pharmaceutical Education will convene March 2. The ninth All-Union Congress of Obstetricians and Gynecologists will meet March 10-15. The All-Union Conference of Endocrinologists will meet March 25-29. At Kazan the fourth All-Union Congress of Ophthalmologists will meet May 15-19. At Leningrad the fourth All-Union Congress of Nose, Ear and Throat Specialists will meet May 7-11 and the twelfth All-Union Congress of Internists, May 25-30.

Lectures in Lithuania by Soviet Physicians

The endocrinologist Prof. Nicolas A. Cherechevsky and the therapeutist Prof. David D. Pletniev gave a series of lectures at Kaunas, the capital of Lithuania, under the auspices of the State University.

A reception was given for the Soviet scientists by the minister of foreign affairs, Mr. Lozoraits. Professors Cherechevsky and Pletniev were invited to repeat this course of lectures in Lithuania in the near future.

Marriages

JAMES QUARLES CHAMBERS JR., Kansas City, Mo., to Miss Mary Josephine Crane of Elizabeth, N. J., April 13.

LOUIS B. LAPLACE, Philadelphia, to Miss Delphine L. R. Hollingsworth of West Chester, Pa., May 4.

JAMES EDWIN WISSLER, Washington, D. C., to Miss Lola C. Johnson of Winchester, Va., March 24.

SAMUEL H. SMITH, Cincinnati, to Miss Frances Pauline Brown at Dayton, Ohio, April 24.

JOSEPH DIXON ROBERTS JR., Longview, Texas, to Miss Virginia Lewis of Dallas, March 29.

JAMES W. DAVIS, Dongola, Ill., to Miss Marie Keily of St. Louis, Nov. 28, 1934.

CODY A. COX, Morton, Ill., to Miss Helen Jane Beitel of Aurora, March 13.

Deaths

George Emmett Bethel ✠ Galveston, Texas; University of Texas School of Medicine, Galveston, 1923; dean and professor of tropical medicine at his alma mater since 1928, instructor of anatomy, 1920-1921, adjunct professor, 1923-1924, and associate professor in 1926; physician to men, university health service, University of Texas, Austin, 1926-1927, and director, 1927-1928; assistant chief resident physician to the Philadelphia General Hospital, 1925-1926; fellow of the American College of Physicians; member of the American Society of Tropical Medicine and the American Heart Association; aged 40; died, April 17, of chronic nephritis.

Edward Blair Sutphen, Morristown, N. J.; Columbia University College of Physicians and Surgeons, New York, 1902; member of the Medical Society of New Jersey and the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; on the staffs of the Morristown Memorial and All Souls hospitals, Morristown, the Overlook Hospital, Summit, and the New Jersey State Hospital, Greystone Park; aged 58; died, April 18.

Charles Russell Barber ✠ Rochester, N. Y.; University of Buffalo School of Medicine, 1882; past president of the Medical Society of the County of Monroe; founder, formerly on the staff and past president of the board of directors of the Park Avenue Hospital, and on the staff of the Monroe County Hospital; for many years member of the board of managers of the Iola-Monroe County Tuberculosis Sanatorium; aged 79; died, April 5, of cerebral hemorrhage.

George Herbert Burnham, Toronto, Ont., Canada; Trinity Medical College, Toronto, 1875; F.R.C.S., Edinburgh, 1881 and M.R.C.S., England, 1881; University of Toronto Faculty of Medicine, 1889; emeritus professor of ophthalmology and otology, University of Toronto Faculty of Medicine; on the staffs of the Toronto General and St. Michael's hospitals; aged 84; died, April 1, of pneumonia.

Charles Emil Brack ✠ Baltimore; College of Physicians and Surgeons, Baltimore, 1895; formerly professor of clinical obstetrics, University of Maryland School of Medicine; fellow of the American College of Surgeons; treasurer of the Medical and Chirurgical Faculty of Maryland; on the staff and member of the board of governors of the Mercy Hospital; aged 69; died, April 4, of myocarditis.

Albert Milton Beal ✠ Moline, Ill.; Drake University Medical Department, Des Moines, 1894; formerly a lawyer; president of the Western College, Toledo, Iowa, 1890-1891; at one time mayor of Toledo, Iowa; for many years president of the board of education of Moline and bank president; on the staff of the Moline Public Hospital; aged 81; died, April 3, of coronary thrombosis.

Charles W. Youngman, Williamsport, Pa.; Jefferson Medical College of Philadelphia, 1883; member of the Medical Society of the State of Pennsylvania; past president of the Lycoming County Medical Society; county health officer; at one time member of the city board of health and health officer; for many years on the staff of the Williamsport Hospital; aged 76; died, March 5.

William Richard Tinker, Manchester, Conn.; University of the City of New York Medical Department, 1880; member of the Connecticut State Medical Society; for many years health officer; in 1897 member of the state legislature; aged 81; on the staff of the Manchester Memorial Hospital, where he died, March 23, of rupture of an aneurysm of the abdominal aorta.

John William Warnick, Johnsonburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1896; member of the Medical Society of the State of Pennsylvania; at one time county medical director, and for twenty-five years member of the board of health in Johnsonburg; aged 71; died, April 12, of cerebral hemorrhage, arteriosclerosis and diabetes mellitus.

Robert Henry Craig, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1896; an Associate Fellow of the American Medical Association; member of the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; on the staff of the Montreal General Hospital; aged 59; died, March 23.

Thomas Arthur Pettepiece ✠ Freeport, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1910; past president of the Stephen County Medical Society; on the staffs of the Evangelical Deaconess Hospital and St. Francis Hospital; aged 60; died, April 15, of aortitis and myocarditis.

John Lambert Coffin, Boston; Boston University School of Medicine, 1876; professor emeritus of diseases of the skin at his alma mater; formerly member of the school committee and board of health of Medford; at one time chairman of the board of trustees of the Westboro State Hospital; aged 83; died, March 15, of coronary stenosis.

Albert Burr Nash, Newark, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; member of the Medical Society of New Jersey; fellow of the American College of Surgeons; on the staff of the Hospital of St. Barnabas and for Women and Children; aged 79; died, March 10.

John Milton Phipps, Indianapolis, Ind.; Hospital College of Medicine, Louisville, Ky., 1899; also a lawyer and a minister; veteran of the Spanish-American War; at one time assistant in pathology, Indiana University School of Medicine; on the staff of the Indiana Christian Hospital; aged 69; died, April 11, of carcinoma of the kidney.

George Washington Whitney Whiting ✠ Medford, Mass.; University of the City of New York Medical Department, 1887; for many years member of the board of education of Somerville; on the staffs of Martha's Vineyard Hospital, Oak Bluff and the Somerville (Mass.) Hospital; aged 70; died, February 14.

Mary Elizabeth Barrell, York Village, Maine; Woman's Medical College of Pennsylvania, Philadelphia, 1897; formerly member of the board of public welfare of Worcester, Mass.; at one time on the staff of the Memorial Hospital, Worcester; aged 72; died, March 14, of paralysis agitans and fracture of the neck of the femur.

John Francis Hayes, Waterbury, Conn.; University of the City of New York Medical Department, 1879; member of the Connecticut State Medical Society; member of the board of education, 1900-1901; aged 77; died, February 24, in St. Mary's Hospital, following an operation for appendicitis, and chronic myocarditis.

Alfred Henry Brauer ✠ Captain, M.C., U. S. Army, Brackettville, Texas; State University of Iowa College of Medicine, Iowa City, 1931; entered the M. C., U. S. Army, as a first lieutenant in 1932 and in 1934 was promoted to captain; aged 28; died, March 11, of cerebrospinal meningitis.

William Nelson Offutt ✠ Lexington, Ky.; Hospital College of Medicine, Louisville, 1902; member of the American Academy of Ophthalmology and Oto-Laryngology; fellow of the American College of Surgeons; on the staffs of the Good Samaritan and St. Joseph's hospitals; aged 58; died, April 3.

Robert H. Wynyard Powell, Ottawa, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1876; honorary registrar of the medical council of Canada; past president of the Canadian Medical Association; fellow of the American College of Surgeons; aged 79; died, April 4.

George Howard Mayhugh, Westerville, Ohio; Physio-Medical College of Indiana, Indianapolis, 1885; Ohio Medical University, Columbus, 1895; member of the Ohio State Medical Association; formerly a member of the board of education and city council; aged 77; died, April 8.

Edward H. Hayward ✠ Detroit; Detroit College of Medicine, 1904; formerly lecturer in bacteriology and assistant professor of medicine at his alma mater; at one time member of the city health department; aged 61; died, February 24, in the Grace Hospital, of pneumonia.

Edward Randolph Turnbull, Lawrenceville, Va.; University of Virginia Department of Medicine, Charlottesville, 1884; member of the Medical Society of Virginia; for many years member of the county school board and county health officer; aged 78; died, March 20.

John Fogo Doudna, Lake City, Mich.; Barnes Medical College, St. Louis, 1899; member of the Michigan State Medical Society; served during the World War; formerly village president, health officer and member of the board of education; aged 60; died, April 9.

Franklin Edward Collins ✠ Brookhaven, Miss.; Vanderbilt University School of Medicine, Nashville, Tenn., 1905; past president of the Tri-County Medical Society; on the staff of the Kings Daughters Hospital; aged 52; died, April 3, of coronary sclerosis.

William Edward Magruder ✠ Baltimore; Baltimore Medical College, 1895; at one time associate professor of therapeutics, College of Physicians and Surgeons; aged 61; died, March 29, in Miami, Fla., of acute peritonitis and carcinoma of the sigmoid.

William Samuel Evans ✠ Columbus, Neb.; College of Physicians and Surgeons, Baltimore, 1903; fellow of the American College of Surgeons; served during the World War; on the staff of St. Mary's Hospital; aged 71; died, March 29, of lobar pneumonia.

Charles E. McCord, Fortville, Ind.; Medical College of Indiana, Indianapolis, 1895; member of the Indiana State Medical Association; past president of the Hancock County Medical Society; aged 65; died, March 19, in Greenfield, of cerebral hemorrhage.

Joseph Schwartz, Sioux Falls, S. D.; State University of Iowa College of Medicine, Iowa City, 1893; member of the South Dakota State Medical Association; aged 70; died, April 13, of diabetes mellitus, arteriosclerosis and decompensation of the heart.

John Henry Fulgham ✠ East St. Louis, Ill.; Marion-Sims College of Medicine, St. Louis, 1895; past president of St. Clair County Medical Society; formerly county coroner; on the staff of St. Mary's Hospital; aged 62; died, March 13, of heart disease.

Winfield Scott Schley ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1896; fellow of the American College of Surgeons; on the staff of St. Luke's Hospital and the Ossining (N. Y.) Hospital; aged 61; died, April 1.

Andrew Augustus Reed, Jeffersonville, Ind.; Kentucky School of Medicine, Louisville, 1896; served during the World War; formerly county jail physician; aged 67; died, March 31, in a hospital at Indianapolis, of diabetes mellitus and gangrene.

Frank Herbert Coffin ✠ Haverhill, Mass.; Boston University School of Medicine, 1900; past president of the Essex North District Medical Society; served during the World War; aged 61; was found dead in bed, April 7, of coronary sclerosis.

Charles Henry French, Pawtucket, R. I.; Bellevue Hospital Medical College, New York, 1880; member of the Rhode Island Medical Society; formerly bank president; at one time health officer of Waterbury, Conn.; aged 76; died, March 4.

David McClelland Perkins, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1893; member of the Medical Society of the State of Pennsylvania; aged 70; died, March 31, of chronic nephritis, hypertension and cerebral thrombosis.

Otto Carl Stutz, Upper Sandusky, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1885; member of the Ohio State Medical Association; county coroner; aged 70; died, February 28.

Warren E. Taylor, Moline, Ill.; Hahnemann Medical College and Hospital, Chicago, 1877; at one time mayor and health officer of Monmouth; formerly managing officer of the East Moline (Ill.) State Hospital; aged 80; died, March 31.

Seth Conway, Sharpsburg, Ky.; Kentucky University Medical Department, Louisville, 1905; member of the Kentucky State Medical Association; aged 55; died, April 3, in the Good Samaritan Hospital, Lexington, of cerebral hemorrhage.

John C. Preston, Avon, N. Y.; University of Buffalo School of Medicine, 1892; member of the Medical Society of the State of New York; health officer of the village of Avon; aged 68; died, March 14, of angina pectoris and arteriosclerosis.

Samuel M. Sacks, Washington, D. C.; George Washington University School of Medicine, Washington, 1907; member of the Medical Society of the District of Columbia; aged 54; died, February 14, of nephritis and diabetes mellitus.

Karl P. Hampton, Seminole, Okla.; American Medical College, St. Louis, 1904; member of the Oklahoma State Medical Association; aged 58; died, March 3, in St. Anthony's Hospital, Oklahoma City, of adenocarcinoma.

Alexander Heustis Dean ✠ Wilkes-Barre, Pa.; Jefferson Medical College of Philadelphia, 1900; on the staff of the Nanticoke (Pa.) State Hospital; aged 59; died, March 19, in the Easton (Pa.) Sanitarium, of myocarditis.

Alvin Zenas Stoner, Bedford Valley, Pa.; University of Pittsburgh School of Medicine, 1912; member of the Medical Society of the State of Pennsylvania; served during the World War; aged 48; died suddenly, February 23.

William Clinton Sheehy, New Bedford, Mass.; University of the City of New York Medical Department, 1890; served during the World War; aged 69; died suddenly, April 13, of angina pectoris and chronic myocarditis.

Hugh Joseph McDonald, Butte, Mont.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1885; member of the Medical Association of Montana; on the staff of the Murray Hospital; aged 73; died, March 22.

Alexander Wilson Pollock, Addis Ababa, Abyssinia, Africa; Western Pennsylvania Medical College, Pittsburgh, 1901; for many years a medical missionary; aged 59; died in February, of cerebral hemorrhage.

Alfred McNally, Lethbridge, Alta., Canada; University of Toronto Faculty of Medicine, 1905; fellow of the American College of Surgeons; on the staffs of the Galt and St. Michael's hospitals; aged 52; died, April 1.

Nicholas Walter Kelly, Memphis, Tenn.; Memphis Hospital Medical College, 1900; member of the Tennessee State Medical Association; served during the World War; aged 57; died, March 23, of pneumonia.

Charles Porter McKee ✠ St. Marys, Ohio; Starling Medical College, Columbus, 1905; past president of the Auglaize County Medical Society; member of the school board; aged 54; died, March 29, of pneumonia.

William Henry Beardsley, Springfield, Vt.; Yale University School of Medicine, New Haven, Conn., 1910; formerly member of the state legislature; aged 52; died, March 2, in a hospital at Hanover, N. H.

Lena Honegger Bertschinger, Rancho Santa Fe, Calif.; Universität Zürich Medizinischen Fakultät, Zurich, Switzerland, 1891; aged 67; died recently, of cerebral hemorrhage, arteriosclerosis and hypertension.

Harry Leo Tapperman, Benson, Ariz.; University of Michigan Medical School, Ann Arbor, 1930; member of the Arizona State Medical Association; aged 28; died, February 23, in Los Angeles.

Alfred Byrd Phillips, Dora, Ala.; Vanderbilt University School of Medicine, Nashville, Tenn., 1883; aged 74; died, March 5, in a hospital at Birmingham, of lobar pneumonia and diabetes mellitus.

Joseph A. McGee, Big Springs, Ind.; Physio-Medical College of Indiana, Indianapolis, 1883; aged 84; died, April 16, in the Withan Memorial Hospital, Lebanon, of endocarditis and arteriosclerosis.

Charles Winn Williams ✠ Cedartown, Ga.; Birmingham (Ala.) Medical College, 1913; formerly secretary of the Polk County Medical Society; aged 45; died, March 8, of influenza and pneumonia.

Adelbert Britton Deynard, New York; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1875; aged 85; died, March 21, in Owen Sound, Ont., of cardiovascular degeneration.

Bernard Francis McGaffigan, Boston; Tufts College Medical School, Boston, 1904; on the staff of the Deer Island Hospital; aged 56; died, April 2, in the Boston City Hospital, of heart disease.

Harold Pederson, Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1907; member of the Minnesota State Medical Association; aged 61; died in March.

John Edmund Dehoff, York, Pa.; Southern Homeopathic Medical College, Baltimore, 1897; member of the Medical Society of the State of Pennsylvania; aged 62; died, February 16.

Edgar Eynon Chivers, Mannsville, Okla.; Rush Medical College, Chicago, 1899; member of the Oklahoma State Medical Association; aged 59; died, March 23, in Ardmore, of pneumonia.

James Ritchie Robertson, Halifax, N. S., Canada; McGill University Faculty of Medicine, Montreal, Que., 1925; aged 34; died, February 27, in the Glace Bay (N. S.) General Hospital.

Marion B. Richards, Harleton, Texas; Hospital College of Medicine, Louisville, Ky., 1905; member of the State Medical Association of Texas; aged 59; died, February 4, of pneumonia.

Thomas M. Calvert, Mannington, W. Va.; Baltimore University School of Medicine, 1892; member of the West Virginia State Medical Association; aged 94; died, March 2.

Byron J. Lillibridge, Braintree, Mass.; Jefferson Medical College of Philadelphia, 1883; member of the Rhode Island Medical Society; aged 74; died, March 20, in Miami, Fla.

Charles B. Chenoweth, Nora Springs, Iowa; Rush Medical College, Chicago, 1884; aged 77; died, March 28, in a hospital at Mason City, of coronary occlusion and acute mastoiditis.

Mark Tenney Phy ✠ Baker, Ore.; Rush Medical College, 1926; aged 36; died, March 29, in St. Vincent's Hospital, Portland, Ore., of peripheral neuritis and bronchopneumonia.

Lewis McClure Campbell, Red Sulphur Springs, W. Va.; College of Physicians and Surgeons, Baltimore, 1887; aged 71; died, March 31, of carcinoma of fundus of the stomach.

Joseph Shelor Stribling, Seneca, S. C.; Bellevue Hospital Medical College, New York, 1888; an Affiliate Fellow of the American Medical Association; aged 71; died, March 16.

Samuel Jones Hayes, Pine Plains, N. Y.; Medical College of the State of South Carolina, Charleston, 1932; aged 37; died, March 7, in a hospital at Baltimore, of multiple sclerosis.

Rudolph Adam Constien ⊕ Ashland, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1900; served during the World War; aged 57; died, March 24.

John William Hooper, Roanoke, Ala.; Jefferson Medical College of Philadelphia, 1884; served during the World War; formerly county health officer; aged 70; died, March 18.

Edward St. Clair Furay, Omaha; John A. Creighton Medical College, Omaha, 1895; served during the World War; aged 65; died, March 6, of arteriosclerosis and myocarditis.

Gustave August Andre ⊕ Hartford, Conn.; University of the City of New York Medical Department, 1895; aged 64; died, March 19, in the Hartford Hospital, of heart disease.

Albert Clement Shute, Pottstown, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1891; on the staff of the Homeopathic Hospital; aged 67; died in March.

William Munroe Urkart, West Bend, Wis.; Milwaukee Medical College, Milwaukee, 1907; aged 56; died suddenly, April 7, in the Wisconsin General Hospital, Madison.

William Righter McNair, Los Angeles; Jefferson Medical College of Philadelphia, 1899; also a pharmacist; served during the World War; aged 61; died suddenly, March 26.

William Lyle Allred, San Francisco; Stanford University School of Medicine, San Francisco, 1931; radiologist to the San Francisco Hospital; aged 50; died, March 7.

William Bertram Scott ⊕ Seattle; George Washington University School of Medicine, Washington, D. C., 1908; aged 60; died, March 12, of carcinoma of the rectum.

Abraham Lincoln Preston, Brookville, Ind.; Medical College of Indiana, Indianapolis, 1884; aged 74; died, February 23, of chronic myocarditis and cerebral hemorrhage.

Thomas McClelland Faddis, Charleroi, Pa.; Jefferson Medical College of Philadelphia, 1894; for many years member of the school board; aged 70; died, March 21.

William E. McGlasson, Commerce, Texas (registered by Texas State Board of Medical Examiners, Act of 1907); aged 61; died, March 17, of cerebral hemorrhage.

James Henry Slaughter ⊕ Kilgore, Texas; Mississippi Medical College, Meridian, 1912; member of the Arkansas Medical Society; aged 48; died, March 17.

J. Wesley Price, Booneville, Miss.; University of Virginia Department of Medicine, Charlottesville, 1894; aged 63; died, March 25, of septic thrombosis and pyemia.

Harry A. Roach, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; aged 53; died, March 20.

William R. Froneberger, Maryville, Tenn.; Tennessee Medical College, Knoxville, 1896; aged 60; died, March 14, in the Knoxville (Tenn.) General Hospital.

Hiram Allen Buell, Prairie Farm, Wis.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1910; served during the World War; aged 50; died, March 20.

Howe A. Jordan, Big Island, Va.; College of Physicians and Surgeons, Baltimore, 1879; member of the Medical Society of Virginia; aged 82; died, March 13.

Charles Herman Hofmann, Los Angeles; New York Homeopathic Medical College, 1879; aged 79; died, February 26, in the Cedars of Lebanon Hospital.

Percy Campbell Overstreet, De Kalb, Miss.; University of Nashville (Tenn.) Medical Department, 1908; aged 52; was found dead, April 13, of heart disease.

John Everette Siler, Lot, Ky.; Hospital College of Medicine, Louisville, 1903; served during the World War; aged 57; died, March 3, of multiple sclerosis.

William Porter Wilkin, New York; Bellevue Hospital Medical College, New York, 1885; aged 73; died recently in Wilmette, Ill., of lobar pneumonia.

Louis J. Toussaint, Milwaukee; Milwaukee Medical College, 1896; aged 67; died, March 24, in the Mount Sinai Hospital, of coronary thrombosis.

Jesse M. Abston, Monroe Township, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1880; aged 86; died recently, of cerebral hemorrhage.

John Wesley Le Seur, Batavia, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1886; aged 77; died, March 10, while aboard a train.

Samuel McKibbin ⊕ Creede, Colo.; Victoria University Medical Department, Coburg, Ont., Canada, 1888; aged 76; died, March 29, of myocarditis.

Robert Thomas Hill, St. Louis; Jefferson Medical College of Philadelphia, 1865; Civil War veteran; aged 97; died, March 23, of chronic nephritis.

Walter Tremaine Purdy, Amherst, N. S., Canada; McGill University Faculty of Medicine, Montreal, Que., 1913; aged 48; died, March 21, at Montreal.

Leo S. Talaska, Toledo, Ohio; Toledo Medical College, 1898; aged 59; died, March 11, in St. Vincent's Hospital, of pneumonia and heart disease.

Beverley Louis Rosswell Kelly, Fordwich, Ont., Canada; University of Western Ontario Medical School, London, 1930; aged 29; died, February 22.

Theodore Jefferson Catlin, Buffalo, Minn.; Rush Medical College, Chicago, 1874; aged 86; died, March 16, in the Catlin Hospital, of pneumonia.

George Washington Hogle, Mount Vernon, Iowa; Miami Medical College, Cincinnati, 1891; aged 74; died, February 10, in Pasadena, Calif.

Charles Granville Duncan ⊕ Socorro, N. M.; University of Maryland School of Medicine, Baltimore, 1881; aged 85; died, March 27.

Charles Fremont Sherman, Stone Ridge, N. Y.; University of Vermont College of Medicine, Burlington, 1890; aged 78; died, March 3.

Alfred J. Skiles, Kenton, Tenn.; Memphis (Tenn.) Hospital Medical College, 1893; aged 71; died, March 25, in a hospital at Memphis.

Thomas O. Douglass, Eupora, Miss. (licensed in Mississippi in 1890); also a druggist; aged 67; was found dead in April, of heart disease.

Josephine Antonia Jewett, Berkeley, Calif.; Oakland (Calif.) College of Medicine and Surgery, 1917; aged 65; died, February 17.

William John Jackson, San Francisco; College of Physicians and Surgeons of San Francisco, 1898; aged 68; died, February 1.

Walter Theron Travis, Dalhart, Texas; Hospital College of Medicine, Louisville, Ky., 1907; aged 48; died recently, of septicemia.

Stacy Burchard Hall, Healdsburg, Calif.; Medical Department of Omaha (Neb.) University, 1901; aged 55; died, February 17.

Alta M. Kesler Boram, South Bend, Ind.; Eclectic Medical Institute, Cincinnati, 1905; aged 53; died, April 12, of diabetes mellitus.

Laurence Reginald Ryan, Santa Barbara, Calif.; Jefferson Medical College of Philadelphia, 1888; aged 76; died, February 4.

Hiram Whisler, Tingley, Iowa (licensed in Iowa in 1887); aged 85; died, February 20, in Des Moines, of chronic myocarditis.

Charles Henry McElfresh, San Diego, Calif.; Marion-Sims College of Medicine, St. Louis, 1898; aged 71; died, in March.

Augustus Milleg, New York; University of the City of New York Medical Department, 1889; aged 67; died, March 13.

Edwin Lyttelton Paulding, Arroyo Grande, Calif.; Medical College of Ohio, Cincinnati, 1882; aged 85; died, February 23.

George Lew Chee, Los Angeles; University Medical College of Kansas City, Mo., 1911; aged 48; died, February 26.

George Monroe Peavler, Bristol, Tenn.; Hospital College of Medicine, Louisville, Ky., 1889; aged 76; died, March 24.

Emerson Boynton, Lancaster, Pa.; College of Physicians and Surgeons, Baltimore, 1897; aged 62; died, February 24.

Joseph Marsh Martin, Lewes, Del.; Jefferson Medical College of Philadelphia, 1894; aged 62; died, March 30.

Callie F. Johnson, Hatfield, Ark. (licensed in Arkansas in 1903); aged 72; died, March 17, of mitral insufficiency.

Harry P. G. Edsell, Liberty, Ind. (licensed in Ohio in 1897); aged 94; died recently, of bronchopneumonia.

Henry N. Princehouse, Smackover, Ark. (licensed in Arkansas in 1903); aged 66; died recently.

James N. Reeves, Baytown, Texas (licensed in Texas under the Act of 1907); aged 73; died in March.

Albert Ellsworth Froom, Belvidere, Ill.; Chicago Medical College, 1886; aged 73; died, March 4.

Bureau of Investigation

A. E. G. HALL

Bringing the Criminal Record of This Quack in the Psychology Field Down to Date

Hall is again loose, after two years incarceration in the Kingston, Ontario Penitentiary. Readers of this department of THE JOURNAL may remember an article published Oct. 13, 1928, on one A. E. G. Hall, who worked the quack psychology racket. According to information collected, Hall's name is Alfred Ernest Edward George Hall and, not content with having most of the letters of the alphabet conferred on him at birth before his name, he has adopted for use after his name the titles "M.D., Ps.D., M.Sc.D., B.A., F.Ps.A., B.L." and possibly some others. Needless to say, the man is not a physician, has never attended any reputable medical school or been licensed to practice anywhere in the United States or Canada.

Hall is said to have been born in London in 1892 and to have been brought to Canada by his parents a year later. He apparently acquired Canadian citizenship, and since he has been grown, has made at least three trips to England.

A few years ago Hall claimed under oath that he held a degree in medicine granted by the McKechnie School of Medicine of Victoria, B. C., in 1916. There is no such institution and never has been. Hall also claimed to have attended "Ballie College" of the University of London for three years and to have obtained the degree of B.A. at that institution. There is no Ballie College, and Hall has never been graduated by the University of London. Hall also claimed during one of the numerous times that he has been under arrest that from 1916 to 1918 he was the Executive Director of the Belgian War Orphans Relief for the Dominion of Canada. This was another story made up out of whole cloth.

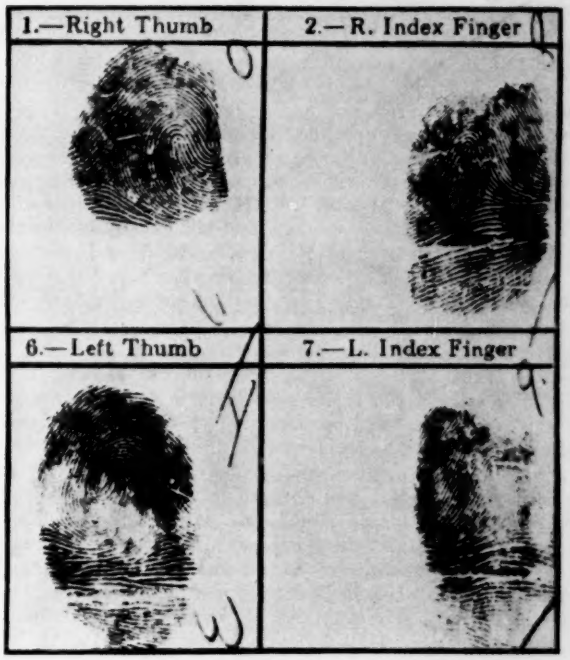
During the various times that Hall came to the United States, he called himself a "consulting psychologist." When he was in Chicago he posed as a specialist of London, Paris, Geneva and Vienna—and possibly points east—and discoursed on "Sex and Civilization." In fact, sex has been Mr. Hall's

Photographs of A. E. G. Hall: Left, taken at the time he entered Kingston (Ont.) Penitentiary, August 1933. Right, taken when he was liberated from the penitentiary in February 1935.

forte. At one time when Hall was in Toronto, the weekly publication *Saturday Night* of that city described Hall as a "sexual quack" who was giving "utterly filthy and unscientific discourses on sexual subjects." He gave the same sort of stuff in the United States, and the Bureau of Investigation received from some persons who were present at his talks statements declaring that Hall showed "a sadistic tendency."

For some time Hall operated at Richmond, Ind., where he is said to have created a fake organization called the "American Academy of Psychological Research" and to have appointed himself "Dean" of the "Academy"! The thing, of course, had not the slighest educational standing; it had connected with it a motley group of faddists, fakers or quacks. It distributed degrees lavishly. Curiously enough, most of the attendants at this so-called Academy hailed from eastern Canada.

In April, 1926, Hall came to Chicago allegedly to attend a conference in the "anti-narcotic cause" and to create a local



Some of the fingerprint records of Alfred E. Hall from the files (No. 46612) of the Federal Bureau of Investigation of the U. S. Department of Justice.

organization and deliver a series of lectures. Hall claimed that he had been engaged by the "International Order of Crusaders" at a salary of $12,000 a year and expenses. He was also to receive 50 per cent of the registration fees of those who would take his "course," as well as such fees as he could wangle out of the public in his pose as a "consultant psychologist." While in Chicago, Hall was arrested for obtaining money under false pretenses and working a confidence game. He was fined and sent to the House of Correction for six months. He was also arrested in Illinois for violation of the medical practice act of that state, but, as so often happens, the case had to be *nolle prossed*, due to the mysterious disappearance of a witness. When Hall was arrested in Chicago in July, 1927, he claimed that he had been the "financial chairman" for Aimee Semple McPherson when she had her "revival meetings."

Hall's police record, so far as the Bureau of Investigation has it—and it is possibly incomplete—is as follows:

1923—Vancouver; arrested for obtaining credit under false pretenses. Sentence suspended.

1924—Vancouver; arrested for conspiring to defraud. Case dismissed. Again arrested, charged with obtaining money under false pretenses and sentenced to six months at hard labor in Oakalla Prison.

1925—Vancouver; arrested for obtaining money under false pretenses. Sentenced to twelve days. Again arrested for obtaining money under false pretenses and sent to jail.

1926—Chicago; arrested on charge of operating a confidence game and obtaining money under false pretenses. Was fined and sentenced to six months in the House of Correction.

1927—Chicago; arrested for practicing medicine without a license. Charge *nolle prossed* for lack of prosecution. At the same time Hall was taken into custody by the United States authorities as an alien who had violated the Immigration Act. He was given hearing and deported.

1928—Toronto; arrested on the charge of vagrancy. Charge withdrawn, as he had money in his pocket.

1930—Toronto; arrested for swindling the Royal York Hotel of about $1,100. Sentenced to six months in the Ontario Reformatory.

1932—Cleveland; arrested by the police department and again deported to Canada.

1933—Toronto; arrested and found guilty of theft. Sentenced to two years in the Kingston Penitentiary.

Hall's escapade in Toronto in 1930 consisted, first, in running up a bill of $220 at the King Edward Hotel, according to the Toronto papers of February, that year. In April, 1930, Hall again made the front page, this time by giving a banquet at the Royal York Hotel of Toronto, at which Sir Geo. E. Foster is alleged to have spoken. The banquet cost $1,000 and the total amount of credit that Hall obtained from the Royal York Hotel was more than $1,100. He was charged with obtaining credit by false pretenses, pleaded not guilty and elected trial by jury. According to the assistant manager of the hotel, Hall, who had introduced himself as "Doctor," had stated that he was general organizer of the National Order of Canada, which, he alleged, was in a flourishing condition, highly organized, and was paying him $12,000 and expenses. Investigation proved that the National Order of Canada was not in a flourishing condition, it actually had not more than seventy-five members, and, of course, Hall was not in receipt of any salary. On May 9, 1930, Hall was convicted and sentenced to six months determinate and six months indeterminate in the Ontario Reformatory. When asked if he had anything to say, Hall struck a dramatic pose and declared that he had been systematically hounded by the authorities.

Not content with this sample of Ontario justice, Hall in 1933 was put on trial in Toronto on a charge of theft. Hall and one Fred Hastings, with whom he was associated, were alleged to have stolen $2,482 paid to them as subscriptions for various magazines and periodicals while they operated an organization known as the Dominion Publications Bureau. Hall acted as his own attorney, and in addressing the jury he said: "You have not before you the ordinary type of criminal that goes out to plunder and steal." He pleaded "justification and honest error." Hall told the jury, also, that he had written books about criminals, had looked after them spiritually, had studied them psychologically, and their actions were not the same as his own. He again charged that he was being hounded by the authorities. Hall was very persuasive and dragged the usual red-herrings across the trail, and the judge, in charging the jury, warned them not to allow themselves to be carried away "by frenzied eloquence." They did not. Hall was sentenced to two years in the Kingston Penitentiary.

A few weeks ago Hall completed his two-year sentence in the penitentiary. Apparently no sooner was he out of the penitentiary than he hired a hall, in accordance with his usual methods, and, as the Toronto *Evening Telegram* reported, "smartly dressed in striped trousers, black coat, wing collar and flowing tie," addressed an audience—of less than a hundred—telling them what an unpleasant place the Kingston Penitentiary is. He also made charges against the warden of the penitentiary and the Hon. D. M. Ormond, Superintendent of Penitentiaries at Ottawa. Hall is reported to have stated to his audience that he didn't regret his experience in the penitentiary and that since getting out he had written a 100-page report. He claims to have been one of those sentenced to be paddled while he was in the penitentiary, but it appears from the report that, unfortunately for the public—and possibly for Hall himself—the sentence was not carried out.

The reason for calling attention to A. E. G. Hall is that this quack and ex-convict is more than likely to make another attempt to get into the United States. If he does, it can be taken for granted from his past record that he will live by his wits and at the expense of the American public.

American Classics in Medicine.—I would plead for a larger interest in the historical method of approach to our subjects. There is a fascination in books; not only merely for their contents, but for something about the author it may be, or something about the period, something occasionally about the binding. In other words, there is an opportunity for the bibliophile; some like to call him a bibliomaniac. There is an opportunity for him in medicine as well as in general literature. There are books and collections of works that mark eras and they are called Medical Classics. This is a very attractive thing, rather expensive I will admit, but you can now and then pick up such things. We have our classics, even American Classics, in medicine.—Welch, W. H.: History of Pathology, *Bull. Inst. Hist. Med.* **3**:1 (Jan.) 1935.

Correspondence

DIAGNOSIS BY CULTURAL METHODS OF RECTAL GONORRHEA IN WOMEN

To the Editor:—In THE JOURNAL, January 19, p. 192, Martin called attention to the not uncommon complication arising from rectal gonorrhea in women with genital gonorrhea. He however bases his diagnosis of rectal gonorrhea on microscopic examination of smears made from material swabbed from the rectal wall. He rejects the cultural method, as he thinks that the results are inconclusive. But it should be admitted that a diagnosis made from the examination of smears from the rectum is often unreliable, especially in view of the occurrence of gram-negative cocci and coccobacilli of the fecal flora in such smear preparations.

Contrary to the views held by Martin on the value of cultural methods for the diagnosis of rectal gonorrhea, I find that cultural methods give excellent results and that diagnosis by culture is much more reliable than by microscopic examination of smears (Ruys, A. Charlotte, and Jens, P. A.: *München. med. Wchnschr.* **80**:846 [June 2] 1933).

Out of eighty-two women with genital gonorrhea that I investigated, forty-eight (60 per cent) were positive for gonococci in cultures at the first examination. Gonococci were also invariably isolated by culture from the rectum of children with gonorrheal vulvovaginitis. All the thirty-eight children that were examined were positive for gonococci by the cultural method.

The following comparative statement of results by the cultural method and by the microscopic method brings out the greater reliability of the cultural method in diagnosis of gonococcic infection of the rectum:

Smear positive, culture positive	48
Smear positive, culture negative	3
Smear doubtful, culture positive	23
Smear doubtful, culture negative	3
Smear negative, culture positive	46
Smear negative, culture negative	218

In seventy-two cases in which smear examination gave a negative result or a doubtful finding, sixty-nine cases were positive for gonococci in culture.

The mediums that I use are Bieling's blood-water agar and Levinthal's agar with ascitic fluid, both of which gave good results. I use a slightly modified procedure for the preparation of the Bieling medium (Ruys, A. Charlotte: *Centralbl. f. Bakt.*, orig. **127**:280 [Jan. 30] 1933). Blood drawn from a horse is immediatately diluted with an equal part of distilled water and kept in a bath at 60 C. for thirty minutes. After that period, two parts of this are mixed with three parts of nutrient agar. It is desirable to dry the medium slightly before inoculating. The mediums are warmed slightly before inoculating. The material is obtained by scraping softly the mucosa of the rectum with a strong platinum loop and transferring a very small bit of mucus or the scraping on to the culture medium. It is then very carefully spread on the surface of the medium by means of a Drigalski spatula on two blood agar plates and two Levinthal ascites agar plates. The plates are incubated at 37 C. in containers with water at the bottom to prevent excessive evaporation. In twenty-four hours the gonococci grow into discrete colonies and in forty-eight hours they are much larger and are characteristic in appearance. They can then be easily distinguished from the colonies of fecal organisms. The gonococcus colonies are translucent, irregular, raised above the surface of the medium, moist and grayish. Subcultures were always made for further determination.

The patients from whom these examinations were made consisted of children and women. The women were patients with genital gonorrhea either in an acute stage or in a chronic stage.

Eight out of forty-eight women that were positive for gonococcic infection of the rectum complained of slight pain and only one suffered from severe symptoms. The others had no symptoms.

Gonococcic infection of the rectum is often overlooked and, as mentioned by Martin, the infection could be recognized only if specially looked for. In the diagnosis of the infection, the examination of smears from the rectum is not as reliable as the cultural method of diagnosis. By means of cultures a larger number of cases were found to be positive, while by the examination of smears many of the positive cases escaped detection.

A. CHARLOTTE RUYS, M.D., Amsterdam, Holland.
Director, Municipal Health Laboratories.

TREATMENT OF PELLAGRA

To the Editor:—In THE JOURNAL, April 20, 1935, page 1377, was an article by Dr. Tom D. Spies on the treatment of pellagra. It is surprising that Dr. Spies made no mention of the achlorhydria or hypochlorhydria that all pellagrins show. In a series of fifty patients from Tennessee and the Carolinas that I have studied it was found that the use of dilute hydrochloric acid in the treatment of pellagra immediately improved the stomatitis and diarrhea that these patients generally show. It has been my opinion that the achlorhydria has a definite pathologic significance and that one must take cognizance of this fact. Dermatitis, diarrhea, stomatitis and nervous symptoms are late manifestations of the disease but an achlorhydric anemia is an early manifestation.

MARVIN SANDORF, M.D., Indianapolis.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF LOCOMOTOR ATAXIA

To the Editor:—A white man, aged 36, married, with no children, had no complaints referable to any system except frequent headaches on the top of the head and difficulty in falling asleep. The past history was essentially negative except that about sixteen years before he had a "blister" on the penis, which healed spontaneously after a few weeks. A routine examination revealed Argyll Robertson pupils, an absent left knee jerk, absent ankle jerks and a suggestive positive Romberg sign. The Wassermann reaction was 4 + with both antigens. From April 10 to July 2, 1934, he was given ten intravenous injections of from 0.45 to 0.6 Gm. of neoarsphenamine and twelve intramuscular injections of 2 cc. each of iodobismitol, once a week. One month later a lumbar puncture was done. Clear fluid under no increased pressure was obtained. There was no increase in cells, and acid chemical tests were negative except for increased globulin. Wassermann and colloidal gold tests were negative. The Wassermann reaction of the blood at this time was still 4 +. There were still no subjective complaints except difficulty in falling asleep. There is apparently no mental deterioration. After a rest period of two months the previous plan of treatment was resumed. After nine injections of iodobismitol, the Wassermann reaction is still 4 +. The diagnosis is apparently tabes dorsalis. Will you please outline a scheme for further treatment. Should tryparsamide be used? He weighs 155 pounds (70 Kg.) and there are no apparent visceral lesions. Please omit name.

M.D., New York.

ANSWER.—In this case the report of a negative Wassermann reaction in the spinal fluid cannot be accepted with certainty unless it is known that the test was carried out with large as well as with small amounts of fluid. A satisfactory Wassermann test on the spinal fluid demands quantitative titration. If the unit of reagents employed by the laboratory in the test is 0.2 to 0.25 cc., the actual test with spinal fluid should be done with amounts of fluid ranging from 0.1 to 1 cc. In patients with tabes dorsalis it is not uncommon to find a positive Wassermann reaction in the fluid with large amounts when the test with small amounts is negative. If such a quantitative Wassermann test has not been done, it would be wise to repeat the lumbar puncture at an early date.

If the spinal fluid is actually as stated—normal, except for some increase in protein—it may be assumed with a fair degree of certainty (and especially in view of the fact that the patient is symptom free and recognizable as tabetic only on the basis of physical signs) that he represents an instance of so-called burnt out tabes; i. e., an inactive process in the nervous system, the neurologic abnormalities representing scars of previous activity. Under these circumstances his treatment may be continued for a minimum of two years with alternating courses of an arsphenamine and a bismuth compound.

These drugs are preferably given in alternation rather than simultaneously, and it is desirable that treatment be continuous rather than intermittent. Rest periods, if interpolated at all, should be short. No attention whatever need be paid to the response of the blood Wassermann reaction.

If, on the other hand, the spinal fluid Wassermann reaction is positive even with large amounts of fluid, it is fair to assume that there is still activity of the infection in the nervous system. It should be remembered that a provocative response may be obtained in the spinal fluid as in the blood and that, even though the fluid may originally have been negative, it may now be definitely abnormal. Under these circumstances it is probably advisable to treat the patient immediately with artificial fever, preferably with malaria. Follow up treatment, after malaria is completed, should consist of alternating courses of an arsphenamine and a bismuth compound for a minimum period of two years.

On the basis of the information supplied, it is probably neither necessary nor advisable to use tryparsamide in this situation. If the tabes is inactive, tryparsamide is unnecessary; if it is active, better results, so far as insurance for the future and shortening of the total duration of treatment are concerned, will be accomplished by the use of fever rather than tryparsamide. Finally, visual reactions due to the use of tryparsamide are more common in tabes than in other types of neurosyphilis.

The serologic control of treatment should rest entirely on the spinal fluid and not on the blood. The spinal fluid examination should be repeated as a routine procedure at intervals of every six months during and for the first two or three years after the completion of treatment, and thereafter yearly or biyearly for the duration of the patient's life.

It goes without saying that the patient's wife should be examined and that, in view of the facts that he has neurosyphilis and that conjugal neurosyphilis is frequent, the examination should include, in addition to a blood Wassermann test, a complete physical and neurologic examination, and laboratory study of the spinal fluid.

PALLOR OF NASAL MUCOUS MEMBRANE AND USE OF HYDROCHLORIC ACID

To the Editor:—I have heard it stated frequently that pallor of the nasal mucous membrane is an indication for prescribing dilute hydrochloric acid wtih meals, particularly in treating patients with chronic atrophic arthritis. This is done apparently regardless of the gastric acidity as revealed in the usual form of gastric analysis. It is supposed to have some beneficial effect on the "acidity" of the body, as expressed in the excreta such as the urine and the body sweat. Will you please discuss the truth or fallacy of these statements and give any references available? Also please explain the probable effects of the continued use of hydrochloric acid by such patients who have an apparently normal gastric acidity to begin with. Kindly omit name and address.

M.D., Massachusetts.

ANSWER.—There is a school of thought in this country which believes that human beings can be divided into groups depending on whether the sympathetic or the parasympathetic system or a mixture of the two is dominant in the constitution. These three types tend to suffer from certain illnesses and the proper use of certain foods and medications has a pronounced effect on the individual and his complaints. Furthermore, the color of the mucous membrane, in particular that of the nasal septum, is not only an aid in assigning any patient to the particular group to which he belongs but is an index to the success of the therapeutic measures instituted.

Patients who have red nasal mucous membranes are those in whom the sympathetic system is dominant. The diseases frequent in them are infections, hyperthyroidism, atrophic arthritis, diabetes mellitus, cancer and hypertension of the vascular system.

Patients in whom the parasympathetic system is dominant and whose nasal mucous membrane is more or less pale tend to suffer from asthma, hay fever, urticaria, eczema, other allergic diseases, hypothyroidism and hypotension of the vascular system.

For each of these groups there are certain foods to be avoided and others to be taken. The chloride, iodine and chlorophyll intake is important. Patients with red septums should avoid acid ash producing foods; patients with pale septums should be given acid ash producing foods and also therapeutic doses of dilute hydrochloric acid. Full details as to

diagnosis and treatment are given in an article published by D. C. Jarvis in the *Archives of Otolaryngology* (**21**:131 [Feb] 1935).

There are others who do not accept this thesis and who have attempted to prove their points by clinical experimentation. For instance, in one publication it was determined that: 1. No correlation could be found between the color of the nasal mucosa and the clinical symptoms of acidosis in fifty critically ill patients, all of whom showed clinical symptoms of acidosis with hyperpnea, dehydration and acetonuria. 2. Age influences the color of the nasal mucosa of normal individuals. After 60 the membranes tend to become atrophied and are very pale, while the membranes of infants are very red. 3. Blonds with pale fair skin have pale mucous membranes, while brunettes with high color have membranes that tend to be red. 4. Posture, exercise, the use of alcohol, the inhalation of dry air or irritants such as dust influence the color of the nasal mucosa. 5. From these observations it may be concluded that the color of the nasal mucosa varies not only in persons who are ill but also in healthy individuals and that the reasons for these variations are not necessarily of a pathologic nature (Bernheimer, L. D., and Cohen, D. J.: The Color of the Nasal Septum, THE JOURNAL, April 29, 1933, p. 1324).

It would perhaps be best to keep an open mind on the ideas expressed by the first mentioned school. Their theories in the minds of many remain unproved, yet the treatment recommended is lacking in danger. Their recommendations could be carried out empirically and the results judged on their own merits. More than one method of treatment in medicine has been used successfully for years before the laboratory proof of its worth became available. Digitalis is a remedy of which this is preeminently true.

As to dilute hydrochloric acid, it can in all likelihood be taken in therapeutic doses by patients with an apparently normal gastric juice over long periods with safety, provided other factors, such as diet, remain normal.

TREATMENT OF SYPHILIS

To the Editor:—A man, aged 40, first came to me in June 1933, at which time he was found to have a four plus Wassermann reaction. There was a history of a scrotal lesion two months previously. The patient was treated continuously with neoarsphenamine and compounds of bismuth and mercury. A course of neoarsphenamine, usually 0.6 Gm. in series of ten weekly injections, was alternated with courses of a bismuth compound, usually bismuth salicylate or potassium bismuth tartrate, once or twice a week for from six to eight weeks. To date he has received thirty-two injections of neoarsphenamine, totaling 18 Gm., thirty-two injections of compounds of bismuth, and eighteen injections of mercuric succinimide. The blood Wassermann and Kahn tests were found to be negative following the first course of neoarsphenamine and have remained so on repeated testing. In December 1933 the patient was operated on for a deflected nasal septum. He was subject to repeated attacks of nasal catarrh. In April 1934 a plastic iritis of the right eye developed. The ophthalmologist did not feel that it was syphilitic in nature. Local treatment by the ophthalmologist and treatment with neoarsphenamine and bismuth compounds were continued at this period in conjunction with potassium iodide by mouth. The eye responded well, and in about one month the condition had cleared. Aug. 1, 1934, there developed a kerato-iritis of the left eye. The blood Wassermann and Kahn tests taken at this time were negative. Spinal fluid examination showed a negative Wassermann test, the faintest trace of globulin, and a cell count of 2. Physical examination was otherwise negative. Two injections of neoarsphenamine were given during this attack along with mercuric succinimide. The ophthalmologist was not quite certain whether or not some aggravation of the eye condition occurred following this last injection. Mercuric succinimide three times weekly and potassium iodide were continued. At this time I am in a quandary as to further treatment with neoarsphenamine. Is the eye manifestation syphilitic? Is it a manifestation of sensitivity to one of the drugs used in the treatment? This last attack of iritis has now cleared remarkably well. Please omit name and address.

M.D., Ohio.

ANSWER.—The treatment has conformed to an adequate general standard for early syphilis. It should be understood, however, that no standard treatment can provide for every phase of special resistance or relapsing tendency in every individual patient. It is therefore conceivable, though unlikely, that the plastic iritis of the right eye is an ophthalmic relapse, even in the presence of a negative blood serologic test. Neoarsphenamine at least, and possibly also bismuth compounds, have a certain amount of nonspecific effect on eye inflammations and it may be that the therapeutic response described was due to nonspecific rather than to specific effect. Mercuric succinimide also has a certain amount of nonspecific effect, but the suggestion that a flare up followed its use is a little more in keeping with the tuberculous or focal infective than with a syphilitic process. The continuously negative blood serologic tests and negative spinal fluid at this time still further reinforce the belief that the patient's syphilitic infection is cured or inactive and that the eye condition comes from some other source.

The question as to whether the eye condition can arise from specific sensitivity to any of the drugs used cannot be answered categorically, for the range of sensitivity manifestations to the arsphenamines and to bismuth compounds is constantly increasing. It seems, however, improbable that a solitary occurrence of this sort would be the entire story in a specific sensitivity. It would seem more worth while to make a thoroughgoing investigation of tuberculous, focal infective and allergic factors before concluding that the patient is reacting specifically to treatment for syphilis.

Under these circumstances, therefore, a continuance of treatment for syphilis by a method that does not appear to have caused eye flare ups would be in order. For this, bismuth salicylate in courses of eight or ten injections with rest intervals of two months between the courses, for at least another year, would appear to be satisfactory. It might be worth while to invoke also a nonspecific protein therapeutic effect by intramuscular injections of whole boiled milk, beginning with 2 cc. once a week and increasing to 10 cc. once a week for a series of ten or even fifteen intramuscular injections. A determined effort should, however, be made to get to the bottom of the eye condition as such without endeavoring to pin every complication such as this on the probably "cured" or inactive syphilis.

HAZARDS OF CARBON TETRACHLORIDE IN TEXTILE MILL

To the Editor:—I would greatly appreciate any help you might give me in obtaining information on the prevention of carbon tetrachloride poisoning in a textile mill.

M.D., New York.

ANSWER.—So far as is known, the use of carbon tetrachloride in the textile industry is somewhat similar to its use in dry cleaning and as a deterging, degreasing agent in general. Whatever the conditions of use may be, whenever 300 or more parts per million of air are present and respired by human beings, injury is possible or probable. Carbon tetrachloride vapors breathed into the lungs are far more dangerous than liquid carbon tetrachloride ingested. It is, of course, well known that carbon tetrachloride extensively has been applied for the eradication of hookworm and other parasites. The following types of injury from carbon tetrachloride are known:

1. Dermatitis, possibly solely due to the defatting action of carbon tetrachloride.

2. Narcosis. Carbon tetrachloride is similar to chloroform and when concentrations are very high may lead to quick death from anesthetic action.

3. Acute poisoning, characterized by inflammation along the respiratory and intestinal tracts. Bronchitis, pneumonia, pulmonary hemorrhage, ocular hemorrhage, gastro-enteritis and intestinal hemorrhage are established features.

4. Delayed poisoning, probably associated with fatty degeneration of the liver; the formation or at least the presence of guanidine.

5. Chronic poisoning. A chronic state is poorly defined and if encountered possibly represents only the sequelae of acute damage.

The typical case as encountered in industry presents, in terms of increasing severity, some or all of the following: vomiting, nausea, abdominal pain, fulness in the abdomen, sense of masses in the abdomen, respiratory inflammation, headache, diarrhea, blood in the stools, sleepiness, mental sluggishness, jaundice, tenderness over the liver, convulsions, delirium.

Since carbon tetrachloride is absorbable through the skin, preventive measures should embrace protection against this form of entry. Among other preventive measures, the following are suggested:

(*a*) Encourage a high intake of calcium, as through the drinking of milk.

(*b*) Avoid alcoholic beverages.

(*c*) Provide closed systems with appropriate vents wherever possible.

(*d*) If completely closed symptoms are not possible, positive pressure helmets may be necessary if concentrations are very high.

(*e*) Exhaust systems should be provided with intakes at the floor level rather than near the ceiling.

(*f*) Avoid direct skin contact with carbon tetrachloride.

(*g*) If completely enclosed systems cannot be provided or if through other measures the concentration of carbon tetrachloride vapors cannot be kept below 500 parts per million of air, some less toxic chemical should be substituted for carbon tetrachloride. High boiling point petroleum derivatives such as Stoddard's Solvent, while toxic, are less toxic than carbon tetrachloride.

Some items of literature:

McCord, C. P.: Carbon Tetrachloride—A Non-Technical Discussion of Its Toxicity, *Industrial Medicine* **1**: 151 (Dec.) 1932.

Lamson, P. D.; Gardner, G. H.; Gustafson, R. K.; Maire, E. D.; McLean, A. J., and Wells, H. S.: The Pharmacology and Toxicology of Carbon Tetrachloride, *J. Pharmacol & Exper. Therap.* **23**: 283 (Nov.) 1923.

Carbon Tetrachloride, Bulletin 93, International Labour Office, Occupation and Health Series.
Report of Investigations 192, 201, 924, Bull. 2499, Department of Interior, U. S. Bureau of Mines, Carbon Tetrachloride Extinguishing of Electric Fires.
Cutler, J. T.: The Accumulation of Guanidine in the Blood Following Acute Liver Injury by Carbon Tetrachloride, Chloroform, Arsenic or Phosphorus, *J. Pharmacol. & Exper. Therap.* **41**: 337 (March) 1931.
Davis, P. A.: Toxic Substances in the Rubber Industry: Carbon Tetrachloride, *Rubber Age* **24**: 1, part two, 483, 1929.
Hayhurst, E. R.: The Use of Carbon Tetrachloride versus Carbon Bisulphide in Industry, *Chem. & Rubber* No. 60, Sept. 3, 1925.
Robbins, B. H.: The Absorption, Distribution and Excretion of Carbon Tetrachloride in Dogs Under Various Conditions, *J. Pharmacol. & Exper. Therap.* **37**: 215 (Oct.) 1929.
Stewart, L. C.: Carbon Tetrachloride in Dry Cleaning, *National Cleaner & Dyer*, April 1931.

SENSITIVITY TO TOMATOES

To the Editor:—I have a patient, aged 25, a registered nurse, who is afflicted with food allergy. She is hypersusceptible to tomatoes in all forms. Urticaria develops in proportion to the amount eaten. Even on handling the raw fruits, as peeling them, she has a red blotch and itching from a splash of juice on the arm or unconsciously touching the face. There is a history of recurrent attacks of facial eczema of a chronic nature in the father. The patient had eczema as an infant from 1 year to 2 years of age. She has dark hair, a dark clear complexion and blue eyes. She discovered by herself, shortly after entering nurses' training at 17, that she developed "hives from tomatoes." She has tried to avoid tomatoes in all forms but frequently gets a little tomato in her food, in the form of vegetable soup, broth, meats or salads. What treatment could be used to desensitize her? Are there any canning companies which put out canned vegetable soup or beef broth without using tomatoes? Please omit name and address. M.D., Indiana.

ANSWER.—The history here of hypersensitivity to tomatoes is a common one and it is not unusual for urticaria to develop on the eating of the foods as well as by contact with them as in this case.

The treatment is to avoid tomatoes in all forms. If this is carried out for perhaps a year or two, the patient may acquire a slight or considerable degree of tolerance for tomatoes. There is a good chance that she will be able to eat cooked tomatoes, but she will probably never be able to eat raw tomatoes.

As far as desensitization is concerned, the patient can be desensitized in all probability, either orally by administering small amounts of tomato with gradual increases, or hypodermically in similar fashion. However, such desensitization is not recommended, as tomatoes can easily be avoided.

An inquiry to Libby, McNeill & Libby brings the answer that their chicken broth contains no tomatoes.

An answer from the Campbell Soup Company brings this reply:

In the blending of Campbell's soups there are many of our kinds which are not prepared by the addition of tomatoes in any form. The Campbell's soups which would be suited to a diet which must be free from tomatoes are:

Julienne	Celery
Chicken	Pea
Consommé	Bouillon
Mutton	Noodle
Asparagus	Printanier

We do know that tomatoes are used in the blending of many soups but we would hesitate to speak specifically about the recipes of other canners.

TREATMENT OF HEREDITARY SYPHILIS

To the Editor:—I have under my care a boy of 8 years who has hereditary syphilis. Before treatment was begun his Kahn reaction was four plus. He has been given twenty injections of neoarsphenamine, most of them 0.45 Gm. each, as well as twenty-five intramuscular injections of bismuth salicylate. A report from the state laboratory just received still gives this boy a four plus Kahn reaction. Will you please make suggestions for treatment that may give better results than those already obtained. Please omit name. M.D., Illinois.

ANSWER.—The treatment outlined has been adequate to date and the dosage of arsphenamine ample for a boy of 8 years who, from the letter of inquiry, probably has no active manifestations of congenital syphilis other than the positive Kahn test. It is not unusual for the reaction in the congenitally syphilitic to remain positive for many years even though active symptoms of syphilis are not present. However, asymptomatic neurosyphilis is present in about 12 per cent of such children, and an examination of the spinal fluid is now definitely indicated in a case such as the one cited. The obtaining of a negative spinal fluid report even though the child does not have symptoms attributable to syphilis, such as interstitial keratitis or nerve deafness, nevertheless warrants a series of courses of a bismuth compound. Fifteen injections of a bismuth preparation twice a year for at least the next three years are frequently ample in such cases. Even though a satisfactory reversal of the blood reaction is noted at the end of this time and no symptoms are present, the child should have annual examinations to note not only the serologic report but also his general development, mental reactions, and progress in school, as well as any new signs or developments. If the blood reaction remains positive, the bismuth compound should be continued for several years longer. On the other hand, if the spinal fluid is reported positive, thus explaining the persistence of the blood positivity, the intensive use of arsphenamine and a bismuth or mercury compound must be continued. When the character of the spinal fluid report suggests impending juvenile dementia paralytica and routine treatment fails to reverse the reaction to negative, malaria therapy should be given before clinical signs of dementia paralytica appear.

HYPERTROPHY OF MAMMARY GLAND

To the Editor:—A girl, aged 11 years, fell about six months ago, striking her left breast on a hard object. Her parents brought her to me about three weeks later on account of pain and tenderness in the breast. On examination, the right breast showed no development at all. The left breast is symmetrically developed to a diameter of about 3 cm. and is moderately tender, the greatest point of tenderness being exactly on the end of the nipple. The nipple itself and the surrounding skin appear perfectly normal. If the other breast were equally developed and there were no complaint of pain and tenderness, one would consider it to be a physiologic development. Since there has been no improvement in the pain and tenderness in the last six months, I am debating the possibility of its being malignant. I find no reference to a cancer of the breast in one of this age and period of development. It would look as though if it were an inflammation it would have shown improvement or gone on to abscess formation by this time. There has been no demonstrable change in size or tenderness in the six months observation. From this meager description would you think the possibilities of cancer great enough to call for removal of a section of this breast for pathologic diagnosis? M.D., Illinois.

ANSWER.—The possibility of cancer of the breast in the case described is so remote that it may be eliminated with a fair degree of certainty. The age of the patient is the most important evidence against carcinoma, as is also the fact that no extension of the lesion has been observed over a period of six months. It does not seem advisable to remove a section for biopsy.

The condition as described is perfectly consistent with a prepuberty unilateral hypertrophy of the mammary gland. Sometimes a physiologic hypertrophy begins in one mammary gland and is accompanied by pain and tenderness due perhaps to an overactivity of the epithelial and connective tissue elements. After some time a similar activity of the opposite breast appears and renders the diagnosis clear. Although the possibility that an actual injury is associated with the present state cannot be excluded with certainty, it is probable that the injury merely served either to call attention to or possibly accentuate a condition of the breast that was already present. The diagnosis suggested is compatible with the clinical course of the lesion during the time of observation and explains its failure to progress if it were malignant as well as its failure to resolve if it were an inflammatory process of traumatic origin.

PREGNANCY AND DIABETES

To the Editor:—Where can I find information concerning the interpretation of a considerable amount of sugar proved to be dextrose and not lactose in the urine of a pregnant patient who showed no sugar in the urine before pregnancy? After a test breakfast of 40 Gm. of available carbohydrate, urine specimens collected at half-hourly intervals show no sugar until the two and one-half hour specimen. Blood sugar at this time is not over 80 mg. by the Folin-Wu method, as is also the fasting blood specimen at 7 a. m. The urinary glycosuria persists on through the entire day but is again negative before the next breakfast. Two and one-half hours after the noon and evening meals, which are also limited to 40 Gm. of available dextrose, the urinary sugar is again at its peak. Blood sugar again two and one-half hours after the noon meal is never over 80 mg. F. B. WARNOCK, B.A., Champaign, Ill.

ANSWER.—Pregnancy is a complication of diabetes and may activate a potential diabetes. This phenomenon is probably related to the same change in endocrine activity that results in the increase in metabolism during pregnancy, and not infrequently the two disturbances may occur to an abnormal degree at the same time. They may or may not clear up after delivery.

The case described may be exhibiting an alimentary glycosuria which, at the present stage of knowledge, must be considered as early or potential diabetes. Should this be the case it would be quite possible for the patient to spill sugar

into the urine during the first hour or two after each meal while still presenting normal blood sugar values when determined in the fasting state or two and one-half hours after the meal.

The other possibility in the case described may be a lowering of the kidney threshold for sugar so that the patient is exhibiting renal glycosuria.

It is suggested that a carbohydrate tolerance test during which urine samples are collected at half-hourly intervals might be helpful in the differential diagnosis. It would then be possible to say whether the patient's kidneys are excreting sugar at a blood sugar level below the normal threshold value of 180 mg. per hundred cubic centimeters.

CORRECTION OF PRESCRIPTION

To the Editor:—Isn't there some mistake in prescription 2 on page 47 of THE JOURNAL, January 5? How can one put 30 Gm. of alum in 250 cc. of water and then add alcohol to make 250 cc.? That is not the way Dr. Fantus taught us to write prescriptions when I was his pupil back in 1902-1905.

E. P. S. MILLER, M.D., Chicago.

ANSWER.—There is a serious and obvious mistake in this formula, in which the words "to make" have unfortunately slipped in instead of "of each." The formula should read as follows:

℞ Alum ..... 30.0 Gm.
Water
Alcohol.....of each 250. cc.

Dissolve the alum in the water and add the alcohol.
M. and label: Apply to part subjected to pressure to prevent bedsore.

It is an interesting fact that alum does not dissolve in the alcohol and water equal parts, if mixed previously, but that it does dissolve if the preparation is made according to the directions.

NO TOXIC HAZARD WITH CIGARET LIGHTER

To the Editor:—There is a cigaret lighter now on the market, made by the Platinum Products Company, 521 Fifth Avenue, New York, which operates by catalysis. In other words, to use it one has to draw through a cigaret and thus inhale a certain amount of the vapor of the fluid they call "lektrolite." Presumably this fluid belongs to the benzene group. Can you tell me whether the constant use of this lighter is attended by danger to health?

CECIL E. REYNOLDS, M.D., Playa Del Rey, Calif.

ANSWER.—This type of lighter has been on the market for about twenty-five years. It will operate with several varieties of highly volatile, low-flash fluids but apparently works best or at least well with Columbian spirit—wood alcohol. By actual test the usual lighter fluids were found not to lend themselves to ready use in this catalytic device. The products of combustion of toxic agents of this general character are rarely so toxic as the unburned vapors. Moreover, the quantity of such vapors arising from a few lightings each hour or day is meager. Theoretically the user of lighters is dealing with a hazardous substance, but the practical danger under usual circumstances is negligible—perhaps more nearly harm free than smoking itself. The high temperature reached by these lighters is of some comparative importance. If one of two cigarets is lighted with the glowing point of another cigaret, while the other is lighted with the flame of a catalytic lighter, the latter cigaret on comparison with the former will be found to have become quite soft almost throughout its extent. This is a result of the much higher temperature from the flame. In a measure, this volatilizes or distils the tobacco of the cigaret. To the extent that smoking is harmful, the first puff in connection with a high temperatured lighter is the most dangerous one. This entire matter of injuries from cigaret lighters, however, lies in the realm of the nebulous. Proof that such devices should be discarded is lacking.

ROENTGEN TREATMENT OF ACNE

To the Editor:—Beckman in "Treatment in General Practice" states that Parkhurst (1932) reports 84 per cent cures of acne by use of x-rays. Please state whether this percentage of cures is generally accepted. Please state also the dosage in such treatments, filtration advised and the interval of treatments.

M.D., Mississippi.

ANSWER.—Eighty-four per cent of cures may be accepted as a fair average in the roentgen treatment of acne vulgaris. MacKee reports 95 per cent of cures in 244 cases. The treatment in all cases was fractional, one-fourth skin unit once weekly, unfiltered, corresponding to 75 roentgens. Other authors report a lower ratio of cures: Michael had 53 per cent in 191 cases after one course of treatment (from ten to sixteen fractional doses) and 85 per cent of cures after a second course. Hazen and Eichenlaub report 80 per cent. Roentgen therapy must be combined with proper systemic, dietetic and hygienic measures in order to secure the best results. It should not be combined with irritating local treatment, and a proper selection of cases is advisable. MacKee has used both filtered and unfiltered rays in acne vulgaris and states that the therapeutic result was the same. A correct technic and an understanding of the possible dangers is essential. MacKee's book on Roentgen Therapy in Skin Diseases should be consulted.

BILATERAL PHLEBITIS IN PREGNANCY

To the Editor:—Is it considered proper by the majority of physicians to advise a therapeutic abortion to an individual who had a moderately severe case of unilateral phlebitis at the last pregnancy? Kindly answer this question pertaining to a patient who had a severe case of bilateral phlebitis as a complication of pregnancy. Please omit the name and address.

M.D., California.

ANSWER.—A previous unilateral or bilateral phlebitis is not an indication for therapeutic abortion, regardless of the severity of the complication. While it is true that there is some danger of recurrence of the condition, a therapeutic abortion is not always a harmless procedure and may be just as productive of a new attack of phlebitis as labor at term.

During pregnancy the patient should receive extra care in order to build up her general resistance, and she should avoid individuals who have infections of any kind.

During labor every effort should be made to avoid injury and infection. Hence the child should be permitted to deliver spontaneously unless an urgent indication arises for operative delivery.

CHRONIC SINUSITIS

To the Editor:—Please give me any information you may have of interest to me in the treatment of chronic sinusitis, with high voltage roentgen therapy. I have been suffering with sinusitis a number of years. I had a radical Caldwell-Luc operation done last year without relief, and I am going to have to do something else soon and would greatly appreciate any information you can give me.

M.D., Missouri.

ANSWER.—High voltage roentgen therapy has not been of value in chronic sinusitis. If a Caldwell-Luc operation did not relieve the chronic nasal sinusitis, the more radical procedure, as carried out in the Denker operation, may give all the relief that is desired. It is essential that every portion of the antral cavity be thoroughly explored and that all diseased mucous membrane, polyps, and so on be removed. The Denker operation offers this opportunity.

RADICULITIS AND TABETIC PAINS

To the Editor:—Your answers with regard to radiculitis and tabetic pains (THE JOURNAL, March 30, p. 1187) ignore the use of alcohol for various intractable pains. Surely after the masterful work of Swetlow, Labat, Ruth, Woodbridge, James White and others who have followed in their footsteps, you must place some confidence in the judicious use of alcohol injection by properly trained men. As a disciple of the late Dr. Gaston Labat and after personal observations in a series of 300 cases, I have found sufficient merit in alcohol nerve block for these so-called hopeless cases to justify calling attention to the undeniable benefits rewarding technicians using these measures.

The last twenty-five years has been replete with discoveries of various agents for local anesthesia. By a process of elimination it is now conceded that procaine hydrochloride is the least toxic of the group. The impetus given by these discoveries and their use in cases for which general anesthesia would carry a decided risk aided the development of the use of local anesthesia. This necessitated more detailed study of neuro-anatomy with the purpose of placing the anesthetic agent accurately, thus minimizing the amount used.

The panorama opens on a new field using local anesthesia for effects that are more permanent. This is being made known frequently by the numerous articles detailing the use of alcohol in combating intractable pains.

In daily practice one sees many patients who may be considered the "forgotten" or neglected group. These patients frequently resort to morphine addiction, quackery or cult devotion. Cases in which diagnoses are made but in which it has been possible to do little are considered "intractable." These patients have run the gamut of medical and surgical procedures to no avail, frequently resorting to neurosurgery with the attendant shock, high mortality rate and a none too bright postoperative prognosis. Cases of advanced peripheral vascular disease, advanced cancer, painful syphilitic syndromes, angina pectoris and the various protracted arthritides and neuritides fall into this category. The use of alcohol to degenerate the nerve fibers that carry the painful messages to the brain has found its place in medicine. There is no excuse for the folding of hands and curtaining the conscience with the adoption of an attitude of smug satisfaction that everything possible has been done unless due cognizance is taken of therapeutic alcohol nerve block in these conditions.

LOUIS A. ABELSON, M.D., New York.

Medical Examinations and Licensure

COMING EXAMINATIONS

ALABAMA: Montgomery, June 24-26. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral (Group A and Group B candidates).* New York, June 10. Sec., Dr. C. Guy Lane, 416 Marlborough St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Final oral and clinical examination (Group A and Group B candidates).* Atlantic City, N. J., June 10-11. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Philadelphia, June 8, and New York, June 10. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: New York, June 8. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Atlantic City, N. J., June 10, and St. Louis, Nov. 19. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Philadelphia, June 7-8. Sec., Dr. Walter Freeman, 1726 Eye St. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Atlantic City, N. J., June 8-10. Sec., Dr. Byrl R. Kirklin, Mayo Clinic, Rochester, Minn.

ARIZONA: *Basic Science.* Tucson, June 18. Sec. Dr. Robert L. Nugent, Science Hall, University of Arizona, Tucson.

COLORADO: Denver, July 2. Address, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, June 8. *Prerequisite to license examination.* Address, State Board of Healing Arts, 1895 Yale Station, New Haven.

DELAWARE: June 11-13. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, Dover.

FLORIDA: Jacksonville, June 17-18. Sec., Dr. William M. Rowlett, P. O. Box 786, Tampa.

GEORGIA: Atlanta and Augusta, June 11-12. Joint-Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

INDIANA: Indianapolis, June 18-20. Sec., Board of Medical Registration and Examination, Dr. William R. Davidson, Room 5 State House Annex, Indianapolis.

IOWA: Iowa City, June 4-6. Dir., Division of Licensure and Registration, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Topeka, June 18-19. Sec., Board of Medical Registration and Examination, Dr. C. H. Ewing, 609 Broadway, Larned.

KENTUCKY: Louisville, June 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 532 W. Main St., Louisville.

MAINE: Augusta, July 2-3. Sec., Board of Registration of Medicine, Dr. Adam P. Leighton Jr., 192 State St., Portland.

MARYLAND: *Regular.* Baltimore, June 18-21. Sec., Dr. John T. O'Mara, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, June 11-12. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Detroit, June 5-7, and Ann Arbor, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: *Basic Science.* Minneapolis, June 4-5. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, June 18-20. Sec., Dr. E. J. Engberg, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, June 12-14. State Health Commissioner, Dr. E. T. McGaugh, State Capitol Bldg., Jefferson City.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in all centers where there are Class A medical schools and five or more candidates desiring to take the examination, June 24-26 and Sept. 16-18. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: Omaha, June 11-12. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEW JERSEY: Trenton, June 18-19. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 24-27. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, Room 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 10. Sec., Dr. Benj. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 2-5. Sec., Dr. G. M. Williamson, 4½ S. 3d St., Grand Forks.

OHIO: Columbus, June 4-7. Sec., State Medical Board, Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, June 5-6. Sec., Dr. J. M. Byrum, Mammoth Bldg., Shawnee.

RHODE ISLAND: Providence, July 2-3. Dir., Department of Public Health, Dr. E. A. McLaughlin, 319 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

TEXAS: Austin, June 18-20. Sec., Dr. T. J. Crowe, 918-19-20 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 26-28. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 19-21. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WISCONSIN: *Basic Science.* Milwaukee, June 1. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Medical.* Milwaukee, June 25-28. Sec., Dr. Robert E. Flynn, 401 Main St., LaCrosse.

WYOMING: Cheyenne, May 20. Act. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

Wisconsin January Examination

Dr. Robert E. Flynn, secretary, Wisconsin State Board of Medical Examiners, reports the oral, written and practical examination held in Madison, Jan. 8-10, 1935. The examination covered 19 subjects and included 100 questions. An average of 75 per cent was required to pass. Fifteen candidates were examined, all of whom passed. One physician was licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Northwestern University Medical School		(1934)	86
University of Louisville School of Medicine		(1933)	81
Harvard University Medical School		(1932)	85, 87
University of Michigan Medical School		(1932)	84
University of Minnesota Medical School		(1932) (1933)	83, 84, (1934) 84
University of Nebraska College of Medicine		(1933)	80
University of Oregon Medical School		(1932)	81
University of Wisconsin Medical School		(1932)	80, (1933) 81, 86
University of Toronto Faculty of Medicine		(1929)	86
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1932)	*

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Indiana University School of Medicine		(1930)	U. S. Navy

* Average grade not reported.

North Dakota January Examination

Dr. G. M. Williamson, secretary, North Dakota State Board of Medical Examiners, reports the oral, written and practical examination held in Grand Forks, Jan. 1-4, 1935. Three candidates were examined, 2 of whom passed and 1 failed. Three physicians were licensed by reciprocity after an oral and practical examination. The following schools were represented:

School	PASSED	Year Grad.
Washington University School of Medicine		(1932)
University of Wisconsin Medical School		(1932)

School	FAILED	Year Grad.
Dalhousie University Faculty of Medicine		(1926)

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1923)	California
Kansas City Hahnemann Medical College, Missouri		(1914)	Kansas
Jefferson Medical College of Philadelphia		(1927)	California

Book Notices

Physical Diagnosis. By Warren P. Elmer, B.S., M.D., Associate Professor of Clinical Medicine, Washington University School of Medicine, and W. D. Rose, M.D. Seventh edition. Cloth. Price, $8. Pp. 919, with 342 illustrations. St. Louis: C. V. Mosby Company, 1935.

This edition presents the subject of physical diagnosis quite completely and in an easily readable form. It is surprising how much sound theory slips in without the heavy physics characteristic of some textbooks. The special sections on radiology and electrocardiography are excellent for beginners in clinical medicine. The general arrangement of the book is satisfactory, with the exception of the section on sphygmomanometry, which rightfully belongs under auscultation of the circulatory system. The absence of a bibliography is unfortunate, because interest in medical history is most easily stimulated during the period when the student first learns to use the traditional tools of the great physicians of the past. Since the author, in his preface, expresses gratitude to critical reviewers of the previous editions, it is only fair to point out that certain parts of this book are below the general standard of excellence and could easily be revised upward. Thus there is inadequate discussion of the subject of primary hypertension, which is much more important than many other conditions to which special chapters are devoted. Venous pressure, spinal puncture and vital capacity are too briefly treated. One is particularly disappointed with the bare mention of bronchogenic carcinoma, nowadays a common form of malignant growth. The importance of x-ray films in the early diagnosis of pulmonary tuberculosis is not emphasized as it should be even in a textbook on physical diagnosis. In the chapters on diaphragmatic pleurisy and pericarditis, no use is made of the classic studies by Capps on pleural and pericardial pain. The addition of a few roentgenograms concerning the various types of cardiac enlargement, and a more systematic treatment of the topic of congenital heart disease would strengthen the section on diseases of the circulatory system. Little is said about the extracardiac consequences of left auricular dilatation in mitral stenosis. Some abbreviation of many paragraphs on clinical pathology would release

space for expansion along these lines. On the whole, this work on physical diagnosis deserves its apparent popularity, because it covers a difficult field in a clear, judicious and thoroughly honest manner.

Medical Report of the Glasgow Royal Maternity and Women's Hospital for the Year 1933. Prepared by D. McK. Hart, M.B., Ch.B., F.R.F.P.S.G., Registrar to the Hospital. Boards. Pp. 184. Glasgow: Aird & Coghill, Ltd., 1934.

The eighth annual report of the largest purely maternity hospital in Scotland, which has 175 beds, shows that during the year 4,595 patients were admitted and 3,198 babies were born in it; 12.4 per cent were stillborn. Seventy maternal deaths occurred in the hospital, giving a death rate of 2.1 per cent. Since the number of abnormal cases in 1933 was 2,976, or 64.7 per cent of the total admissions, these figures are not to be wondered at. The hospital is a dumping ground for all the neglected and forlorn obstetric cases occurring in the city and for miles around, as far as the Western Isles. The antepartum department has increased enormously, seventy-eight beds being devoted to it in the hospital in addition to an immense amount of work done in the dispensary, the total attendance at the latter being 21,501. In addition, the hospital has a home service and, in 1933, 4,510 women were attended in childbirth at their homes, 48,612 visits being made to them. Only 6.6 per cent of the cases delivered at home were abnormal; the fetal mortality was 2 per cent (later given as 1.3 per cent) and the maternal was 0.05 per cent. Hospital cases are divided into two classes, those attending the clinic before delivery, and the others. To show the poor quality of the material this hospital has to handle, one item may be mentioned. Fifteen women were in such poor condition on arrival that they died before they could be delivered. The patients' temperatures after delivery are divided into two classes, puerperal fever or sepsis and puerperal pyrexia, the latter including those cases in which the fever is of unknown origin or from mastitis, urinary infection, infectious fevers, and so on. The standard of pyrexia is different from that generally used; a patient is febrile if she has a temperature of 100.4 (38 C.) or more for twenty-four hours or repeated during the first twenty-one days after delivery; 683 patients came under this classification. A statistical report (there are more than 200 tables) does not lend itself to a critical review, and one must be particularly careful not to use it for comparison with other institutions. The thoroughness with which the statistics have been worked up and the clarity with which the results are presented are commendable and inviting to all heads of obstetric departments and of maternity hospitals. It is much to be regretted that American institutions do not regularly publish similar reports of their work.

Skin Hazards in American Industry. By Senior Surgeon Louis Schwartz, U. S. Public Health Service, and Dr. Louis Tulipan, Professor of Dermatology, New York University. Prepared by direction of the Surgeon General. United States Treasury Department, Public Health Service. Public Health Bulletin No. 215. Paper. Price, 10 cents, Pp. 54, with illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1934.

Month by month new evidences arise that the commonest practical causes of occupational diseases are to be found in the large group of substances acting on the skin. It is possible that the total list of individual substances leading to industrial dermatoses may exceed 700. This brochure of the United States Public Health Service contributes many new items to the already long list of skin irritants and sensitizers. The title of the publication possibly might lead the reader to expect a general discussion of the skin hazards of all American industry. Instead, it is made up of a series of little related chapters covering investigations of dermatitis in rubber, oil refining, synthetic dye manufacturing, candy making, silk throwsters, linseed oil manufacture, perfume making, and the pyrethrum insecticide industry. The chapters on dermatitis in the rubber industry and dermatitis in synthetic dye manufacturing stand out as superior. All these publications well reflect the strides being made toward precise diagnoses in occupational disease work. Thirty years ago the usual physician may have possessed a knowledge of some twelve items of occupational diseases and among them may have appeared "arsenic pox" as the sole known occupational skin disorder. In contrast, these present publications, in the midst of direct or indirect reference to several hundreds of skin hazards, include the statement that "tetra-methyl-thiuram-monosulphide" is a well known source of skin reactions in hypersensitive individuals. The desire for the determination of ultimate causes of disease states is better being fulfilled in connection with occupational diseases than for almost any other division of medicine. These investigations constitute an excellent example of near exactness in diagnosis. Primarily this collection of articles on industrial dermatoses will serve the practical needs of dermatologists, industrial hygienists and plant physicians. But since every scientific worker, whatever his special interests may be, needs stimulation from other fields of endeavor, this interesting and inexpensive governmental publication should be read, as it gives an opportunity for insight into the country's most motile branch of medicine—occupational diseases.

Eleventh Scientific Report on the Investigations of the Imperial Cancer Research Fund. Under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England. Published by the authority of the Executive Committee. Boards. Price, 30s. Pp. 177, with illustrations. London: Taylor & Francis, 1934.

The first three papers in this volume are devoted to studies on different strains of filtrable fowl tumors by Foulds. In the first paper, on the growth and spread of six filtrable tumors of the fowl, transmitted by grafts, are reported six strains of filtrable tumors transmitted by serial grafts. Although the primary tumor was always situated in the same place (the breast), the secondary growth showed different and characteristic sites of predilection. Furthermore, the observations showed differences in the rate and mode of growth, in the proportion of successful inoculations and regressions, and especially in the distribution of metastases. The individuality of tumor strains is emphasized and the conclusion is drawn that different tumor strains have distinguishing characteristics of growth and dissemination which are retained indefinitely.

Regarding the histology of these tumors, the second paper, on histologic studies on filtrable tumors of the fowl, with special reference to metastatic growths, is especially a study of anomalous features encountered in metastatic growths. The author states that all these tumors showed variations which could not be established by selective transmission. Transplantation of atypical tumors restored them to typical forms. In this manner the temporary nature of the aberrant forms is proved. Conspicuous departures from the usual histologic structure in secondary growths occurred in the thymus-concurrent proliferation, and abnormal differentiation of the epithelial cells of the gland raised the problem of the capacity for differentiation of normal thymus tissue. This problem was investigated by autoplastic transplantation of the thymus gland. When thymic tissue is removed from the fowl and reinoculated into the breast of the same bird there is first a necrosis of the thymocytes. Epithelial cells survive and undergo hyperplasia. In some transplants there is differentiation of squamous epithelium. The potentialities of thymic epithelium are completely realized only under abnormal conditions. Autoplastic transplantation and tumor invasion lead to a degree of epithelial differentiation not found in the normal gland at any age. In both instances there is destruction of thymic tissue followed by hyperplasia of epithelial cells in an abnormal environment.

Two papers by A. F. Watson, on tar cancer in mice maintained on diets supplemented with fresh liver, show the effect of fresh liver in the diet on the susceptibility to tar cancer in mice. These investigations followed the observation that any foodstuff the inclusion of which in the basal diet improved the general condition of the animals also produced the same effect on the rate of growth of the benign and malignant tissues; but ox liver was found to occupy an anomalous position in this respect. The experiments indicated an increased carcinogenic response in tar-treated mice when the diet was supplemented with fresh liver. Larger numbers of animals developed warts and epitheliomas, and benign warts appeared earlier; but the average interval of time between the first tar application and the development of a malignant condition was not reduced. If the administration of liver is discontinued after the first appearance of benign warts there is no difference in the rate of development of malignancy. Since the liver diet does not accelerate

the onset of malignancy it is suggested that the development of benign hyperplasia and the superimposition of the malignant state are conditioned in part, at least, by different factors. The factors in fresh liver responsible for the response are heat stable. A preparation of hog stomachs clinically tested in pernicious anemia induced no increased tumor response in mice. This constitutes evidence against identification of the carcinogenic factor with the hematopoietic factor.

Two studies of E. S. Horning, on micro-incineration of the tar tumors of rodents and on the action of radium on the inorganic structure of tumor cells as shown by micro-incineration, give the experience of the Cancer Research Fund with the micro-incineration method of microscopic slides of tumor tissues. These are preliminary reports which demonstrate by means of excellent pictures the fidelity with which the inorganic mineral ash reproduces the most delicate details of cell structure.

Three papers by Crabtree and Cramer dealing with the action of radium on cancer cells, and Crabtree's paper on variations of metabolism and radiosensitivity of tissue in bicarbonate and phosphate-buffered mediums, constitute important contributions to the biologic mechanism of the effect of radium on tumor cells. The experiments showed that susceptibility to the action of radium is not a fixed property of a given cell but varies with its environment. Anaerobiosis, hydrocyanic acid and cold diminished the functional activity of the respiratory mechanism, but the effect on the susceptibility to radium is not the same. Anaerobiosis diminished, whereas hydrocyanic acid and cold increased susceptibility to radium. In the third paper, Crabtree and Cramer conclude that gamma rays have the same biologic effect on cancer cells in vitro as a mixture of beta and gamma rays. In both cases the functional condition of the respiratory system determines the biologic response of the cell, while the glycolytic mechanism is not primarily concerned.

In the next paper (p. 119) Cramer shows the damaging influence of phosphate-Ringer solution on the respiratory system of tumor tissue. This effect is shown by direct measurements of carbohydrate metabolism and the increased susceptibility of tumor tissues suspended in phosphate-buffered mediums to gamma radiation.

An important investigation is communicated in the next paper (p. 127) by Cramer. A study of the therapeutic action of radium on spontaneous mammary carcinoma of the mouse showed histologic differences in the reactions to the treatment in radiosensitive and radioresistant tumors. In radiosensitive tumors the reaction begins with invasion of the tumor by macrophages, which in turn leads to splitting of the malignant cells affected by irradiation. In radioresistant tumors, radium does not produce invasion with macrophages. In view of the results reported, which show that radiosensitivity is not a fixed property of the tumor cells but can be altered by altering the respiratory mechanisms of the cell, these results become highly important; for, since the oxygen supply of the tumor cells is dependent on the stroma, the latter must be partly responsible for the property of radiosensitivity. It is shown, furthermore, that the temporary cessation of growth of malignant cells after irradiation is due to a direct action on these cells. A sharp distinction is made between the true recurrences, which are due to the recovery of tumor cells that were dormant after irradiation, and apparent recurrences, which are really the result of a new development of tumor growth due to inadequate irradiation. The bearing of these facts on clinical results is extensively discussed.

The report concludes with two papers by Ludford, on the structure and behavior of the cells in the tissue cultures of tumors and the reaction of normal and malignant cells to fat-soluble colored compounds that are insoluble in water. In the first, with excellent illustrations (dark ground photographs of living cells), the appearances of tumor cells are shown that help to distinguish them from the associated macrophages and fibroblasts. In the second paper a new method of staining fatty substances in living cultures is described.

Ludford's results suggest that although malignant cells are readily permeable to fat soluble substances they are less permeable to water soluble compounds than normal cells. The tentative explanation is put forward that the plasma membrane of malignant cells is relatively rich in fatty substances.

These researches are prepared and presented with the usual thoroughness and scientific accuracy of these authors. The illustrations are magnificent. The report adds further important knowledge to the metabolism and cytology of tumors and to radiation effects on tissues.

The Doctor's Son and Other Stories. By John O'Hara. Cloth. Price, $2.50. Pp. 294. New York: Harcourt, Brace & Company, 1935.

The author of this novel is the son of a physician. In his book "Appointment in Samarra" he revealed the tremendous influence of his boyhood in a medical home. The present volume is a collection of his sketches, many of which appeared in the *New Yorker*. The opening story is, however, a long story not previously published, which recounts the life of the doctor and of the doctor's son during the great influenza epidemic. It is medical realism to the highest degree and it is offered in modern diction, showing the influence of Hemingway. Physicians are certain to find this story fascinating, humorous, tragic, exciting.

Dietetics for the Clinician. By Milton Arlanden Bridges, S.B., M.D., F.A.C.P., Director of Medicine, Department of Correction Hospitals, New York. Foreword by Herman O. Mosenthal, A.B., M.D., Director of Medicine at the New York Post-Graduate Medical School, Columbia University, New York. Second edition. Cloth. Price, $10. Pp. 970. Philadelphia: Lea & Febiger, 1935.

In the presentation of a second edition of this work, errors in the first volume have been corrected. New subject matter has been added and all of the sections have been brought down to date. The book provides a tremendous amount of tabular data, including reliable analyses of the common and proprietary foods. There are also tables giving the latest data concerning alcoholic beverages. The volume has been prepared by the author with the assistance of a considerable number of competent clinicians and is one of the most immediately practical and useful volumes in dietetics available to the physician.

Medicolegal

Hospitals: Liability for Death of Delirious Patient.—The deceased entered the Williams Sanatorium, Inc., an institution operated for profit, for the purpose of being treated for a small cancer on his lip, Nov. 14, 1932. The treatment, rendered by Dr. Boyd Williams, the owner of the institution, was painless and Brase apparently suffered no ill effects therefrom, although he remained at the hospital. In the evening of November 15, however, Brase was found, partly dressed, attempting to get out on a porch of the hospital. The nurse who apprehended him testified that he was slightly delirious but that she had little difficulty in persuading him to return to his bed. He talked irrationally and made several attempts to rise from his bed but was restrained by two nurses. Shortly after his return to bed he became highly excited, and the two nurses testified that it was necessary for them to apply "restraints" in order to keep him in bed. Dr. Williams was not then at the hospital and when informed over the telephone of the patient's condition he advised the nurses to use "restraints" and to administer a hypodermic of strychnine. The "restraints" used consisted of heavy ticking which was placed across the patient's knees, the ankles were fastened to the foot of the bed, and the arms strapped to the sides of the bed, one of them being fastened by a handcuff. One hypodermic of strychnine was given the patient but his delirious condition continued. Another hypodermic was given a short time before he died. He fought strenuously to free himself of the "restraints" until about 4 o'clock on the morning of the 16th of November, when his struggles ceased and at about 6 o'clock he died. The executor of Brase's estate brought suit against the Williams Sanatorium, Inc., and another. From an order denying the defendants' motion for a judgment notwithstanding the verdict, the defendants appealed to the Supreme Court of Minnesota.

At the time Brase entered the hospital he was given a physical examination by Dr. Williams, who testified that Brase was "in good health." Another physician who had examined him shortly before his entrance to the hospital came to the same

conclusion. An autopsy showed the vital organs of the body to be normal, with the exception of the lungs, which were congested. Two physicians testified that death was caused by exhaustion due to overexertion as evidenced by the congested condition of the lungs, and that in cases of patients in an excitable or delirious condition the administration of strychnine, a stimulant, is improper. A sedative should have been administered, according to the witnesses. Williams himself testified that the use of "restraints" was not improper in such a case and that the cause of death was not exhaustion. He was corroborated in this by another physician. The jury might well have found, said the court, that the delirium and excitability of the patient, aggravated by the improper administration of strychnine, caused the patient to exhaust himself in his struggles against the bars which held him to the bed. The evidence was sufficient to sustain a finding that the treatment administered was not proper practice and that it caused Brase's death.

The appellants contended that the trial court erred in admitting evidence that Dr. Williams had been convicted of practicing medicine without a license in the state of Minnesota. The practice of medicine without a license, said the court, is made a gross misdemeanor under section 5714, Mason's Minnesota Statutes, 1927, and under section 9948, evidence of the conviction of a crime is admissible for the purpose of affecting the weight of a witness's testimony. A gross misdemeanor being a crime, pointed out the court, the evidence complained against was admissible. Finding no error in the record, the judgment of the trial court against the defendants was affirmed. *—Brase v. Williams Sanatorium, Inc., et al. (Minn.), 256 N. W. 176.*

Wills: Criteria of Testamentary Capacity.—In law, said the Supreme Judicial Court of Maine, every mind is sound that can reason intelligently in the particular transaction; and every mind is unsound that cannot so reason. The law does not undertake to test the intelligence and define the exact quality of mind which a testator must possess. Soundness is a matter of degree. That a man may make a valid will, it is not necessary that the greatest mental strength shall prevail. The essential qualification for making a will is a sound mind. "Sound mind," within the statute of wills, continued the court, comprehends ableness enough to recollect property and beneficiaries, and conceive the practical effect of the will. The expression does not mean a perfectly balanced mind. A mind naturally possessing power, not unduly impaired by old age, or enfeebled by illness, or tainted by morbid influence, is, in legal contemplation, a "sound mind."

In this particular case, the testatrix was advanced in years. But, said the court, stage of life and resultant weakness of body do not necessarily deprive one of the right to make a will. Neither age nor bodily disease is, of itself, a disqualification. Intellectual and physical weakness, with partial failure of mind and memory, is said not to be solely an indication of inability to make a will. Although a testatrix be old and infirm, she may competently will, if she then had intelligence enough to understand correctly what she was doing, and did, deliberately, what she meant to do. Hallucination, temporary in nature, is not per se insanity. When a hallucination has become permanent, it is to be deemed insanity, general or particular, according to the nature of the delusion. To invalidate a will, an insane delusion must be operative on testation. A person whose mind is affected by such a delusion, however unreasonable and absurd, may make a valid will, provided the delusion is not of influence. To affect its soundness, the will must be the direct offspring of delusion controlling the mind. Except so far as it may tend to show the quality of the testator's mind at the time of executing the will, the condition of his mind before or after that time is unimportant. If he was then rational and acting rationally, or, in popular phrase, knew and understood what he was about, the will is valid. Although fixed insanity has been established, it may be shown that execution of the will was during a lucid interval. There may, in a case of senile dementia, be such a thing as a lucid interval, during which the person is qualified to will. The will of the testatrix in the present case was upheld by the Supreme Judicial Court of Maine.—*In re Loomis' Will; In re Mitchell et al. (Maine), 174 A. 38.*

Society Proceedings

COMING MEETINGS

American Medical Association, Atlantic City, N. J., June 10-14. Dr. Olin West, 535 North Dearborn Street, Chicago, Secretary.

American Academy of Pediatrics, New York, June 7-8. Dr. Clifford G. Grulee, 636 Church Street, Evanston, Ill., Secretary.

American Association for the Study and Control of Rheumatic Diseases, Atlantic City, N. J., June 10. Dr. Loring T. Swaim, 372 Marlborough Street, Boston, Secretary.

American Association for the Study of Goiter, Salt Lake City, June 24-26. Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pa., Secretary.

American Association for Thoracic Surgery, New York, June 3-5. Dr. Duff S. Allen, 3720 Washington Boulevard, St. Louis, Secretary.

American Association of Genito-Urinary Surgeons, White Sulphur Springs, W. Va., June 6-8. Dr. Henry L. Sanford, 1621 Euclid Avenue, Cleveland, Secretary.

American Association of Medical Milk Commissions, Atlantic City, N. J., June 10-11. Dr. Harris Moak, 360 Park Place, Brooklyn, N. Y., Secretary.

American Bronchoscopic Society, Toronto, Canada, June 1. Dr. Lyman Richards, 319 Longwood Drive, Boston, Secretary.

American Child Health Association, Iowa City, June 19-22. Dr. Philip Van Ingen, 50 West 50th Street, New York, Secretary.

American Federation of Organizations for the Hard of Hearing, Cincinnati, June 2-6. Miss Betty C. Wright, 1601 35th Street N.W., Washington, D. C., Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., June 10-11. Dr. Russell S. Boles, 1901 Walnut Street, Philadelphia, Secretary.

American Gynecological Society, Hot Springs, Va., May 27-29. Dr. Otto H. Schwarz, 630 South Kingshighway Boulevard, St. Louis, Secretary.

American Heart Association, Atlantic City, N. J., June 11. Dr. H. M. Marvin, 50 West 50th Street, New York, Acting Executive Secretary.

American Laryngological Association, Toronto, Canada, May 29-31. Dr. William V. Mullin, 2020 East 93d Street, Cleveland, Secretary.

American Laryngological, Rhinological and Otological Society, Toronto, Canada, June 3-5. Dr. Robert L. Loughran, Sharon, Conn., Secretary.

American Neurological Association, Montreal, Canada, June 3-5. Dr. Henry Alsop Riley, 117 East 72d Street, New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. J. Milton Griscom, 2213 Walnut Street, Philadelphia, Secretary.

American Orthopedic Association, Philadelphia, June 5-8. Dr. Ralph K. Ghormley, Mayo Clinic, Rochester, Minn., Secretary.

American Otological Society, Toronto, Canada, May 27-29. Dr. Thomas J. Harris, 104 East 40th Street, New York, Secretary.

American Physiotherapy Association, Atlantic City, N. J., June 11-12. Miss Louise Jetter, 17 East Styles Avenue, Collingswood, N. J., Secretary.

American Proctologic Society, Atlantic City, N. J., June 10-11. Dr. Frank G. Runyeon, 1361 Perkiomen Avenue, Reading, Pa., Secretary.

American Radium Society, Atlantic City, N. J., June 10-11. Dr. Edward H. Skinner, 1103 Grand Avenue, Kansas City, Mo., Secretary.

American Society of Clinical Pathologists, Atlantic City, N. J., June 7-9. Dr. A. S. Giordano, 531 North Main Street, South Bend, Ind., Secretary.

American Surgical Association, Boston, June 6-8. Dr. Vernon C. David, 59 East Madison Street, Chicago, Secretary.

American Therapeutic Society, Atlantic City, N. J., June 7-8. Dr. Oscar B. Hunter, 1835 Eye Street N.W., Washington, D. C., Secretary.

American Urological Association, San Francisco, June 25-28. Dr. Gilbert J. Thomas, 1009 Nicollet Avenue, Minneapolis, Secretary.

Associated Anesthetists of the United States and Canada, Atlantic City, N. J., June 10-12. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association for Research in Ophthalmology, Atlantic City, N. J., June 11. Dr. Conrad Berens, 35 East 70th Street, New York, Secretary.

Association for the Study of Allergy, Atlantic City, N. J., June 10-11. Dr. Warren T. Vaughan, 808 Professional Building, Richmond, Va., Secretary.

Association for the Study of Internal Secretions, Atlantic City, N. J., June 10-11. Dr. F. M. Pottenger, 1214 Wilshire Boulevard, Los Angeles, Secretary.

Conference of State and Provincial Health Authorities of North America, Atlantic City, N. J., June 15. Dr. A. J. Chesley, State Department of Health, St. Paul, Secretary.

Connecticut State Medical Society, New Haven, May 22-23. Dr. C. W. Comfort Jr., 27 Elm Street, New Haven, Secretary.

Illinois State Medical Society, Rockford, May 21-23. Dr. Harold M. Camp, Lahl Building, Monmouth, Secretary.

Maine Medical Association, York Harbor, June 23-25. Miss Rebekah Gardner, 22 Arsenal Street, Portland, Secretary.

Massachusetts Medical Society, Boston, June 3-5. Dr. Alexander S. Begg, 8 The Fenway, Boston, Acting Secretary.

Medical Library Association, Rochester, N. Y., June 17-19. Miss Frances N. A. Whitman, 25 Shattuck Street, Boston, Secretary.

Medical Women's National Association, Atlantic City, N. J., June 9-11. Dr. Alice I. Conklin, 55 East Washington Street, Chicago, Secretary.

Minnesota State Medical Association, Minneapolis, June 24-26. Dr. E. A. Meyerding, 11 West Summit Avenue, St. Paul, Secretary.

Montana, Medical Association of, Helena, July 2-3. Dr. E. G. Balsam, 208½ North Broadway, Billings, Secretary.

National Association of Private Psychiatric Hospitals, Washington, D. C., June 1. Dr. James M. O'Neill, St. Vincent's Retreat, Harrison, N. Y., Secretary.

National Tuberculosis Association, Saranac Lake, N. Y., June 24-27. Dr. Charles J. Hatfield, Henry Phipps Institute, Philadelphia, Secretary.

New Mexico Medical Society, Albuquerque, May 23-25. Dr. L. B. Cohenour, 219 West Central Avenue, Albuquerque, Secretary.

North Dakota State Medical Association, Minot, May 27-28. Dr. Albert W. Skelsey, 20½ Broadway, Fargo, Secretary.

Pacific Northwest Medical Association, Spokane, Wash., June 27-29. Dr. C. W. Countryman, 407 Riverside Avenue, Spokane, Wash., Secretary.

Rhode Island Medical Society, Providence, June 6. Dr. J. W. Leech, 167 Angell Street, Providence, Secretary.

Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., June 10-11. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Digestive Diseases and Nutrition, Chicago

2: 1-64 (March) 1935

Diarrhea. J. L. Kantor, New York.—p. 1.

Constipation. H. J. Spencer, New York.—p. 7.

Weltmann Test in Diseases of Liver. M. Kraemer, Newark, N. J.—p. 14.

*Diverticula of Duodenum and Diabetes. W. B. Thorning Jr. and H. F. Root, Boston.—p. 17.

Studies on Neutralization of Gastric Acidity: Ewald Test Meal and X-Ray (Barium Meal) Studies in Patients with Duodenal Ulcer, Gastrojejunostomy and Gastric Resection. R. Elman, St. Louis, and J. W. MacLeod, Montreal.—p. 21.

*Glycosuria and Lactosuria of Pregnant and of Lactating Women. H. J. Brock and R. S. Hubbard, Buffalo.—p. 27.

Dry Natural Digestive Juices: Their Properties and Laboratory and Clinical Use. W. N. Boldyreff, Battle Creek, Mich.—p. 33.

Cascade Stomach: Review. R. Upham, New York.—p. 38.

Therapy of Nonmalignant Biliary Tract Lesions. A. O. Whipple, New York.—p. 44.

Diagnosis and Treatment of Amebic Abscess of Liver: Study Based on Forty-Eight Hundred and Eighty-Four Collected and Personal Cases. A. Ochsner and M. DeBakey, New Orleans.—p. 47.

*Pruritus Ani: New Treatment. N. J. Simmons, Boston.—p. 53.

Diabetes and Diverticula of the Duodenum.—Thorning and Root report diverticula in the duodenum in two diabetic patients with previous operation for gallstones. The possibility that inflammation in or about such diverticula can by extension cause chronic pancreatitis and diabetes was not demonstrable. The persistence of digestive symptoms after a gallstone operation may occasionally be due to such diverticula. The downward course in one patient over a period of five years may be attributed to several causes, such as cardiovascular disease, a possible gallstone in the common duct, a neoplasm and the results of the duodenal diverticula. In the other patient the authors have no suggestion that the diverticulum is responsible for symptoms or pancreatitis. In attempting to evaluate the significance of the diverticula, their frequency without serious symptoms as well as the complications produced by them must be borne in mind.

Glycosuria and Lactosuria of Pregnant and Lactating Women.—Brock and Hubbard outline a method capable of demonstrating lactose in concentrations as low as from 5 to 10 mg. per hundred cubic centimeters and discuss the results of its application to a series of urine specimens from pregnant, lactating and normal women. Lactose is usually absent from the urine of normal women, although occasionally traces, probably of alimentary origin, may be found. Lactose is almost always present in increased amounts in the urine of lactating women during the first days after parturition. It can be demonstrated, at least in some instances, months after delivery. The lactosuria probably results from an overflow of active mammary glands. Lactose is present in small amounts in the urine of a large proportion of pregnant women. Sometimes it can be demonstrated in the early months of pregnancy but is not always found even in the days immediately preceding parturition. In the opinion of the authors this lactosuria is caused by activity of the mammary glands. Dextrose was present in the urine of lactating women in slightly greater concentration than it was in the urine of a comparable series of nonpregnant, nonlactating women, but the difference was small and probably not significant. Sugar of this type was present in quite large amounts in the urine of pregnant women. This glycosuria did not appear to be clinically significant. Positive reactions with Benedict's qualitative reagent were due to dextrose in the urine from normal subjects, to lactose in the urine from lactating women, and in a majority of instances to dextrose in the urine of pregnant women.

Pruritus Ani.—Simmons classifies the etiology of pruritus ani into pathologic changes in or about the rectum and anus, infections of the skin or mucous membrane, systemic diseases causing perirectal itching and idiopathic or essential pruritus ani. The author has employed a solution of 0.5 per cent of nupercaine, 1 per cent of phenol and 10 per cent of benzyl alcohol in almond oil. He has used this solution with excellent results in twenty cases, freedom from pruritus lasting from four to six months. After the anal region has been cleansed, 5 cc. of the solution is injected under the itching area. The posterior quadrant is injected on the first visit and the lateral and anterior quadrants on subsequent visits. Pooling of the oily solution, infection or eczema may lead to sloughing and a prolonged healing period.

American Journal of Diseases of Children, Chicago

49: 287-556 (Feb.) 1935

Anaphylactogenic Properties of Milk: Immunochemistry of Purified Proteins and Antigenic Changes Resulting from Heat and Acidification. B. Ratner and H. L. Gruehl, New York.—p. 287.

Anaphylactogenic Properties of Malted Sugars and Corn Syrup. B. Ratner and H. L. Gruehl, New York.—p. 307.

*Blood Phosphorus During Development and Healing of Rickets: Notes on Lack of Relationship Between Level of Plasma Phosphorus and Rachitic State. J. Warkany, Cincinnati.—p. 318.

*Evaluation of White Blood Cell Picture in Ambulatory Children with Positive Tuberculin Reactions: Supravital Studies. C. H. Smith, New York.—p. 327.

*Dilute Snake Venom for Control of Bleeding in Thrombocytopenic Purpura. H. M. Greenwald, Brooklyn.—p. 347.

The Adolescent Heart. H. H. Lissner, J. L. C. Goffin and M. H. Rosenfeld, Los Angeles.—p. 353.

Circulation Time in Normal Children. S. H. Averbuck and W. Friedman, New York.—p. 361.

Bacillary Dysentery as Observed Among Normal Children in Huntington, W. Va. G. M. Lyon, Huntington, W. Va.—p. 367.

*Effect of Scarlet Fever on Immunity to Diphtheria as Determined by the Schick Test. F. G. Kojis and J. D. Craig, New York.—p. 383.

Intestinal Flora in New-Born Infants, with Description of New Pathogenic Anaerobe, Bacillus Difficilis. I. C. Hall and Elizabeth O'Toole, Denver.—p. 390.

Blood Phosphorus During Development and Healing of Rickets.—Warkany's experiments on rats show that a single large dose of viosterol does not bring the inorganic blood phosphorus back to normal if the animals are kept under the original rickets-producing conditions. After ten days, when complete healing of the lesions of the bones is shown by roentgen examination, the inorganic phosphorus has increased to from only 50 to 60 per cent of the normal value for phosphorus in rats. This value, approximately 4 mg., then remains unchanged for weeks, in spite of the continued rickets-producing diet. This is in contrast to the results of experiments in which rats on a rickets-producing diet showed a decrease of phosphorus to about 2 mg. A method is described, based on the principle of Kuttner's molybdic acid-stannous chloride reaction, which can be performed with 0.05 cc. of serum or plasma. A single determination of phosphorus has little significance in the analysis of experiments or in the treatment of clinical rickets.

Leukocytes in Ambulatory Children with Tuberculin Reactions.—Smith examined periodically the white blood cell count with the supravital technic in an endeavor to discover any significant alterations produced by manifest disease in twenty-three ambulatory patients having the childhood type of tuberculosis. The results were compared with similar blood counts of normal children. The age periods extended from infancy to 4 years and from 4 to 13 years. The peripheral blood of the ambulatory child who was already infected but whose contact with the source of exposure had been broken differed, except for minor alterations, in no wise from the normal. A lymphocytic increase constituted the prominent feature. The blood count does not perform the function of a diagnostic test in tuberculosis, but in periods of suspected clinical activity it does supply information of a more precise nature of the pathologic process than can be obtained from the complaints of the patient, the physical examination or the roentgenogram. The cellular changes were most pronounced during activity in the younger child. The alterations noted in the blood smear differed only in degree from a group of fatal cases of tuberculosis in young children. The author suggests a

tentative monocytic percentage and monocyte-lymphocyte ratio as a guide to early manifestations of activity. It is still problematic whether a comparison of the changes in the blood before and after administration of tuberculin can be utilized to represent the state of focal activity. These changes may possibly serve as an indication of the immunologic status established by the primary infection and to portray the character of the cellular response in the event of later reinfection.

Snake Venom for Control of Bleeding in Thrombocytopenic Purpura.—Of eight patients treated by Greenwald with splenectomy and repeated transfusions during the years from 1928 to 1932 inclusive, two died of cerebral hemorrhage and one of postoperative shock. Three patients were treated in 1933 with intradermal injections of diluted snake venom; active bleeding was controlled rapidly in every case. No further bleeding occurred in two children; one patient, who was almost exsanguinated on admission to the hospital and who did not receive the injections regularly, manifested oozing from the nasal mucous membranes six weeks after the beginning of the treatment.

Effect of Scarlet Fever on Immunity to Diphtheria.—Kojis and Craig state that of 219 hospitalized patients having scarlet fever eight lost their immunity to diphtheria as determined by the Schick test. The presence of complications, the severity of the infection and the age of the patient had no effect on the loss of immunity to diphtheria. Of the group of patients to whom antitoxin had been administered, 1.6 per cent lost their immunity to diphtheria as compared with 6 per cent of the group of patients to whom no antitoxin was administered. Every patient having scarlet fever should be given a Schick test during his convalescence; and until it has been demonstrated that a positive reaction to the Schick test may revert spontaneously to a negative one following an attack of scarlet fever, the patient should be immunized if the reading is found to be positive.

American Journal of Hygiene, Baltimore

21: 1-248 (Jan.) 1935

Trypanocidal Action of Normal Human Serum: Nature of Substance Responsible for Trypanocidal Effect and Its Relationship with Bactericidal Activity of Normal Human Serum. J. T. Culbertson and P. S. Strong, New York.—p. 1.

Studies on Trypanocidal Power of Normal Human Serum. B. J. Handler, New York.—p. 18.

Experiments on Acquired Immunity to Metazoan Parasite by Use of Nonspecific Worm Materials. H. M. Miller Jr., St. Louis.—p. 27.

Antibody Response of Rabbits During Prolonged Immunization with Type I Pneumococcus Vaccines. L. A. Barnes and B. White, with assistance of Charlotte M. Clarke, Boston.—p. 35.

Etiology of Mumps. C. D. Johnson and E. W. Goodpasture, Nashville, Tenn.—p. 46.

Studies of Acute Respiratory Infections: V. Attempts to Demonstrate Bacteriophage for Pneumococci and Influenza Bacilli. D. H. Brainard and W. C. Noble Jr., New York.—p. 58.

Fractional Ultrafiltration. H. C. Allisbaugh and R. R. Hyde, Baltimore.—p. 64.

Attempt to Ascertain Behavior of Anaplasma Marginale in Ticks Transmitting Anaplasmosis. E. V. Cowdry and C. W. Rees, St. Louis.—p. 94.

Ultrafiltration Studies with Yellow Fever Virus. J. H. Bauer and T. P. Hughes, New York.—p. 101.

Culture and Reactions of Purified Protozoa. R. W. Glaser and N. A. Coria, Princeton, N. J.—p. 111.

Influence of Carbohydrates on Intestinal Protozoa in Vitro and in Vivo. R. Hegner and Lydia Eskridge, Baltimore.—p. 121.

Elimination and Cross-Infection Experiments with Trichomonads from Fowls, Rats and Man. R. Hegner and Lydia Eskridge, Baltimore.—p. 135.

Effects of Environmental Changes on Growth and Multiplication in Populations of Balantidium. F. O. Atchley, Baltimore.—p. 151.

Relation of Bacteria and Bacterial Filtrates to Development of Mosquito Larvae. L. E. Rozeboom, Baltimore.—p. 167.

Plasmodium Vaughani (Novy and MacNeal). R. D. Manwell, Syracuse, N. Y.—p. 180.

Field Studies of Anthelmintic Action of Ortho-Heptylphenol and 6-Hexylmetacresol Against Ascaris Lumbricoides, Necator Americanus and Trichuris Trichiura. P. D. Lamson, Nashville, Tenn.; D. M. Molloy, San Jose, Costa Rica, and H. W. Brown, Nashville, Tenn.—p. 188.

Artificial Immunization of Rats Against Trichinella Spiralis. O. R. McCoy, Rochester, N. Y.—p. 200.

Effect of Repeated Light Exercise on Blood Cells of Albino Rats. Gretchen L. Moorehouse, Baltimore.—p. 214.

Effect of Visible Radiation and Eosin on Rachitic Rat. A. Szczygiel and J. H. Clark, Baltimore.—p. 224.

Effect of Infra-Red Radiation on Growth of Vitamin Deficient Rats. A. Szczygiel, Baltimore.—p. 229.

Study of Seasonal Distribution of Anopheles in Houston, Texas. H. C. Matthes, Houston, Texas.—p. 233.

American J. Obstetrics and Gynecology, St. Louis

29: 309-468 (March) 1935

*Intestinal Complications Resulting from Prolonged Radium and X-Ray Irradiation for Malignant Conditions of Pelvic Organs. T. E. Jones, Cleveland.—p. 309.

Critical Study of Five Hundred Cases of Eclamptogenic Toxemia. F. H. Falls, Chicago.—p. 316.

Five Year Results in Fifty-Six Cases of Carcinoma of Corpus Uteri. Q. U. Newell and H. S. Crossen, St. Louis.—p. 326.

Intractable Dysmenorrhea: Relief by Sympathetic Neurectomy. F. S. Wetherell, Syracuse, N. Y.—p. 334.

*Pneumococcic Pelvic Infection in Adults. J. E. King, Buffalo.—p. 341.

Intra-Uterine Application of Carbon in Incomplete Abortion. B. H. Carroll, Toledo, Ohio.—p. 349.

Mono-Amniotic Twin Pregnancy: Case Record with Review of Literature. J. K. Quigley, Rochester, N. Y.—p. 354.

*The Cold Test in Pregnancy: Preliminary Report of Its Use in Prenatal Care. L. M. Randall, S. E. Murray and R. D. Mussey, Rochester, Minn.—p. 362.

Use of Paraldehyde in Obtaining Obstetric Analgesia and Amnesia. H. F. Kane and G. B. Roth, Washington, D. C.—p. 366.

Study of Carcinoma of Cervical Stump Developing After Subtotal Hysterectomy. W. P. Healy and A. N. Arneson, New York.—p. 370.

Maternal, Fetal and Neonatal Morbidity and Mortality. F. L. Adair, Chicago.—p. 384.

Synthesis and Excretion of Hippuric Acid in Pregnancy. A. Hirsheimer, Cleveland.—p. 395.

Study of Blood Sugar Levels in Eclampsia. C. R. Mays and W. M. McCord, New Orleans.—p. 405.

Congenital Anemia of the New-Born. H. D. Pasachoff and L. Wilson, New York.—p. 415.

Simple Ether Oil Apparatus. R. P. Little, Santa Paula, Calif.—p. 424.

Traction in Forceps Deliveries. B. Wylie, Cleveland.—p. 425.

Experimental Studies of Puerperal Infection: V. Variation in Susceptibility of Skin to Streptococcus Toxin During Pregnancy. C. C. Torrance, Albany, N. Y.—p. 434.

Traumatic Rupture of an Early Pregnant Uterus. G. S. Reeder and C. G. Moore, Fremont, Neb.—p. 439.

Pentobarbital Sodium Analgesia: Report of Two Hundred and Five Cases. J. P. Boylan, New York.—p. 440.

Analysis of Maternal Mortality in Ten Thousand Obstetric Cases. D. Feiner, Brooklyn.—p. 444.

Determination of Urinary Histidine as Chemical Test for Pregnancy. T. R. Seidman, Rochester, N. Y.—p. 451.

Analysis of One Hundred and Forty-Six Cases of Placenta Praevia. J. P. Marr, New York.—p. 454.

Ovarian Pregnancy. W. C. Thro, New York.—p. 457.

Intestinal Complications from Radium and Roentgen Irradiation.—Jones points out that in 520 patients having cervical carcinomas, who received radiation therapy, there have been seven known cases of benign stricture of the intestine causing obstruction which might easily have been construed as, or confused with, metastatic deposits. In five the obstruction was in a movable segment of the sigmoid, and in two in the small intestine. Since similar methods of therapy are in general use, it seems probable that the incidence of the lesion is greater than is surmised, and, if similar cases have been attributed to metastasis in the past, the mortality statistics relating to metastasis from cervical carcinoma are open to question. The intestinal obstruction developed in the seven patients from eight months to eight years after radiation therapy for cervical carcinoma. If the condition actually is a benign stricture caused by irradiation, it is obvious that additional roentgen treatment would only aggravate the condition and hasten the end. Therefore, a patient in whom unusual abdominal symptoms are present, particularly if they simulate intestinal obstruction, may have a stricture of the intestine and may be restored to normal health by resection of the lesion. Before attributing this disability to metastasis, thorough reexamination by sigmoidoscopic and roentgenographic studies should be made to eliminate the possibility of this curable complication. Strictures in the small intestine are difficult to visualize unless the obstruction is practically complete. Barium in large amounts is inadvisable, and therefore exploratory operation is warranted, especially in patients in whom there is no evidence of recurring carcinoma in the pelvis.

Pneumococcic Pelvic Infection in Adults.—King states that the clinical manifestations of pneumococcic pelvic infections in adult women are quite constant and characteristic. There is often a previous indisposition usually associated with the symptoms of an infection of the upper respiratory tract. The invasion of the peritoneum is characterized by its sudden onset with chills or "chilly feelings." The pain is sudden, severe, and

located in the lower part of the abdomen. The pulse rate is high at first, but with early localization the rate drops out of ratio with the temperature. A leukocyte count of 20,000 or more is usual with a polymorphonuclear count of 90 per cent or higher. With a fulminating spread the evidences of general peritonitis are present. The distinguishing point is the rapid formation of pus, which takes place earlier and in far greater quantity than in peritonitis from appendicitis or other causes. The author divides pneumococcic pelvic infections in adult women into four groups: 1. The pelvic abscess in which the infection, having become walled off early, remains confined to the pelvis. 2. The generalized peritonitis in which the entire abdominal peritoneum becomes the abscess sac. 3. An infection confined to the tube and ovary. 4. Puerperal infection following either abortion or labor at term. Patients in the first group recover promptly on draining of the abscess by posterior colpotomy. The cases of generalized peritoneal infection of the second group have a high mortality. Until the clinical and laboratory features have been more carefully elaborated on which an early diagnosis may be made, there is little hope of improvement in the present mortality. The author believes that it is reasonable to expect that prompt drainage would result in the infection remaining localized in the pelvis and that it would spread to the general peritoneum in fewer cases. Colpotomy is such a simple and safe operative procedure that there is little that can be urged against it. In the presence of a well developed general peritonitis, adequate drainage is the only hope.

The Cold Test in Pregnancy.—Randall and his associates determined the reactions to the cold test of Hines and Brown, numbering 130, on 104 pregnant women. The only values that they have for comparison deal with the general problem of hypertension. They feel that the hypertension associated with toxemia of the latter months of pregnancy is related to a toxin which affects the whole maternal organism and that pre-eclamptic toxemia is associated with spastic constriction or with contraction of the arteriolar system. This constriction or contraction may be related to a particularly reactive vasomotor system. It is possible that a pregnant woman who manifests an exaggeratedly reactive vasomotor system in response to the cold test is more likely to suffer from toxemia of the latter months of pregnancy. Toxemia has not developed in any case in which the response to the cold test has been persistently normal and a hypertensive reaction has been demonstrated in all cases in which toxemia has developed. Of the patients who have manifested a definitely exaggerated reaction, 33 per cent gave the usual signs of toxemia in the latter months of pregnancy.

American Journal of Ophthalmology, St. Louis

18: 103-204 (Feb.) 1935

Gonioscopic Findings After Elliot Operation. M. U. Troncoso and A. B. Reese, New York.—p. 103.
Social Service in Ophthalmology. Eleanor P. Brown, New York, and L. T. Post, St. Louis.—p. 119.
Unilateral Exophthalmos: Etiologic and Diagnostic Studies in Eighty-Two Consecutive Cases. C. S. O'Brien and P. J. Leinfelder, Iowa City.—p. 123.
Studies on Infectivity of Trachoma: III. Filtrability of Infectious Agent of Trachoma. L. A. Julianelle and R. W. Harrison, St. Louis.—p. 133.
Clinical Ophthalmic Ergograph. C. Berens, New York.—p. 139.
Squint Measurement with Priestley Smith's Improved Method. M. E. Alvaro, São Paulo, Brazil.—p. 143.
Peripheral Iridotomy (Curran) in Glaucoma. R. O'Connor, San Francisco.—p. 146.
Simultaneous Closure of All Central Retinal Vessels. M. B. Bender, New York.—p. 148.
Surgery of Rectus Muscles of Eye: Selection of Operative Procedures by Differential Diagnosis. A. de H. Prangen, Rochester, Minn.—p. 151.

18: 205-306 (March) 1935

Pseudoxanthoma Elasticum and Angioid Streaks. W. L. Benedict and H. Montgomery, Rochester, Minn.—p. 205.
Hereditary Congenital Ptosis: Report of Pedigree and Review of Literature. F. H. Rodin and H. Barkan, San Francisco.—p. 213.
Management of Case of Convergent Strabismus. Margaret Dobson, London, England.—p. 226.
Ocular Manifestations Observed in Intracranial Adamantinoma: Report of Eighteen Cases. T. B. Holloway, Philadelphia.—p. 230.
Blepharochalasis: Report of Case. B. Y. Alvis, St. Louis.—p. 238.
Concerning Technic of Multiple Micropuncture for Treatment of Separated Retina: Additional Devices. C. B. Walker, Los Angeles.—p. 246.

American Journal of Physiology, Baltimore

111: 231-482 (March 1) 1935

Permeability of Red Cell Membrane to Glucose. K. A. Klinghoffer, New Haven, Conn.—p. 231.
Rôle of Nervous System in Regulation of Glycogen Metabolism of Skeletal Muscle. H. M. Hines and G. C. Knowlton, Iowa City.—p. 243.
Reactivity of Uterus to Presacral Nerve Stimulation and to Epinephrine, Pituitrin and Pilocarpine Administration During Certain Sexual States in Anesthetized Rabbit. J. J. Sauer, Cecelia E. Jett-Jackson and S. R. M. Reynolds, Brooklyn.—p. 250.
Function of Brain in Olfaction: Effects of Large Cortical Lesions on Olfactory Discrimination. H. G. Swann, Chicago.—p. 257.
Note on Reflex Thresholds in Cat During Spinal Shock. G. P. McCouch, W. J. Snape and W. B. Stewart, Philadelphia.—p. 263.
Synaptic Delay of Motoneurons. R. Lorente de Nó, St. Louis.—p. 272.
Refractory Period of Motoneurons. R. Lorente de Nó, St. Louis.—p. 283.
Sugar Utilization in Eviscerated Rabbits. D. R. Drury, Boston.—p. 289.
Influence of Duodenal Secretions on Acid Gastric Contents. C. M. Wilhelmj, L. C. Henrich and F. C. Hill, Omaha.—p. 293.
Sodium, Chloride and Protein Changes Induced by Adrenalectomy and Glucose Administration. H. Silvette and S. W. Britton, Charlottesville, Va.—p. 305.
*Effect of Urine from Pregnant Women on Ovary-Stimulating Potency of Hypophyses of Rabbits and Rats. L. Goodman, Boston.—p. 312.
Survival of Salt Treated Adrenalectomized Rats. R. Gaunt, C. E. Tobin and Jo Howland Gaunt, Cold Spring Harbor, N. Y.—p. 321.
Effect of Anoxemia on Pyloric Sphincter. E. J. Van Liere, G. Crisler and I. A. Wiles, Morgantown, W. Va.—p. 330.
Relation of Stray Light in Eye to Retinal Action Potential. G. A. Fry and S. H. Bartley, St. Louis.—p. 335.
Physiologic Effects of Pituitary Growth Hormone: Growth and Efficiency of Food Utilization. H. W. Nilson, L. S. Palmer and Cornelia Kennedy, St. Paul.—p. 341.
Prolactin Induces Broodiness in Fowl. O. Riddle, R. W. Bates and E. L. Lahr, Cold Spring Harbor, N. Y.—p. 352.
Gross Action of Prolactin and Follicle Stimulating Hormone on Mature Ovary and Sex Accessories of Fowl. R. W. Bates, E. L. Lahr and O. Riddle, Cold Spring Harbor, N. Y.—p. 361.
Some Metabolic Effects of Clamping Visceral Arteries, Splanchnic Vasoconstriction and Adrenal and Hepatic Stimulation, with Especial Reference to Calorigenic Action of Adrenin and Sympathin. F. R. Griffith Jr. and F. E. Emery, Buffalo.—p. 369.
Characteristic Variations in Combinations of Linear Chest Electrodes (Multiplane Chest Leads) Resulting from Experimental Ventricular Lesions. D. I. Abramson and J. Weinstein, with technical assistance of Pearl Kramer, Brooklyn.—p. 382.
Estrous Cycle and Weights of Organs in Relation to Hypophysis in Hairless Rat. F. E. Emery, Buffalo.—p. 392.
Qualitative Blood Cell Changes in Rat Due to Vitamin A. P. D. Crimm and D. M. Short, Evansville, Ind.—p. 397.
Reaction of Cat to Electrical Currents Directed Through the Heart. G. H. Ettinger, Kingston, Ont.—p. 406.
Function of Round Window in Hearing. E. Culler, G. Finch and E. Girden, Urbana, Ill.—p. 416.
Comparative Study of Effect of Trauma on Healthy Vigorous Dogs With and Without Adrenal Glands. W. W. Swingle and W. M. Parkins, Princeton, N. J.—p. 426.
Mechanism of Circulatory Changes Accompanying Insulin Hypoglycemia. A. C. Ernstene, J. E. F. Riseman, Beatrice Stern and B. Alexander, Boston.—p. 440.
Hourly Variations in Weight Loss Following Ingestion of Food. C. I. Hovland, New Haven, Conn.—p. 448.
Subnormal Period of Nerve Response. Helen Tredway Graham, St. Louis.—p. 452.
Influence of Parathormone on Neuromuscular System: Experimental Analysis. E. Gellhorn, Chicago.—p. 466.
Metabolism of Single Normal Mouse Lymph Nodes. J. Victor, Cold Spring Harbor, N. Y.—p. 477.

Effect of Pregnancy Urine on Ovary-Stimulating Potency of Hypophyses.—Goodman observed that, in rabbits, the intravenous injection of ether-extracted human pregnancy urine increases the ovary-stimulating potency of the hypophyses of normal adult male and female rabbits and of spayed adult female rabbits. Contrariwise, in rats the subcutaneous administration of ether-extracted human pregnancy urine decreases the ovary-stimulating potency of the hypophyses of adult male and female rats and does not change the potency of the hypophyses of castrated adult male rats. In a small series of spayed female rats the subcutaneous administration of ether-extracted human pregnancy urine increases the ovary-stimulating potency of the hypophyses. Spaying, without treatment with urine, increases the ovary-stimulating potency of the hypophyses of both rabbits and rats. The ovary-stimulating potency of hypophyses of normal adult male rats is greater than that of adult female rats. After gonadectomy the increase in potency is greater in the females. The present experiments suggest that in the rabbit the action of human pregnancy urine on the hypophysis is partly indirect through the gonads and partly direct on the hypophysis itself. The influence on the hypophysis

is similar to the effect of gonadectomy. In the rat on the contrary the effect of pregnancy urine on the hypophysis appears to be an indirect one only through the gonad. This gonadal influence differs from that occurring in the rabbit in that it is presumably due to the inhibitory action of estrogenic substance or the testis hormone.

American Journal of Public Health, New York

25: 239-388 (March) 1935

Relation of Retail Price of Milk to Production Costs. T. Parran Jr., Albany, N. Y.—p. 239.
Cause of Breast Cancer. E. Bogen, Olive View, Calif.—p. 245.
Efficacy of Typhoid Prophylaxis in the United States Navy. S. S. Cook, Washington, D. C.—p. 251.
Id. R. U. Patterson, Washington, D. C.—p. 258.
Epidemiologic Studies on Relapsing Fever in California. H. L. Wynns and M. Dorthy Beck, San Francisco.—p. 270.
Hydrocyanic Acid Gas and Other Toxic Gases in Commercial Fumigation. A. Cousineau, Montreal, and F. G. Legg, Detroit.—p. 277.
The Part of the Public Health Nurse in the Epidemiology of Syphilis: Maternity and Child Health Services. Helen S. Hartley, Stockton, Calif.—p. 295.
Some Observations on Use of Alum Precipitated Diphtheria Toxoid. W. T. Harrison, Washington, D. C.—p. 298.
Home Canning and Public Health. F. W. Tanner, Urbana, Ill. —p. 301.
Toxicity of Brilliant Green for Certain Bacteria. E. K. Kline, Olean, N. Y.—p. 314.
The Plague Situation. W. H. Kellogg, Berkeley, Calif.—p. 319.
Rôle of the Sanitary Inspector in the Public Health Program. C. E. Waller, Washington, D. C.—p. 323.
Nutritive Value of Dried Fruits. Agnes Fay Morgan, Berkeley, Calif. —p. 328.
Beverage Bottling and Beer Dispensing: Covering Everyday Problems of Sanitary Inspector. F. E. DeGroff, Los Angeles.—p. 336.
Isolation of Streptococci from Milk. W. M. Groesbeck, Hornell, N. Y. —p. 345.
Central Information Service on Current Practices of Health Departments. J. W. Mountin, Washington, D. C.—p. 347.

American Journal of Surgery, New York

27: 389-574 (March) 1935

Major Trigeminal Neuralgia. F. C. Grant, Philadelphia.—p. 430.
Extraperitoneal Method of Transplanting Ureters into Sigmoid. F. H. Lahey, Boston.—p. 435.
*Diagnostic Value of Urine Diastase. J. Foged, Copenhagen, Denmark. —p. 439.
Treatment of Undescended Testicle, with Particular Reference to Endocrine Therapy and Torek Operation. F. I. Harris, San Francisco.—p. 447.
Goiter, a Continuous Disease. J. D. Martin Jr. and D. C. Elkin, Atlanta, Ga.—p. 455.
Demineralization of Skeleton: Report of Five Cases with Different Proved Etiology. S. K. Livingston, Hines, Ill.—p. 464.
*Rationale of Jelks' Operation for Rectal Stricture: Preliminary Report. H. E. Bacon, F. H. Murray and J. D. Schofield, Philadelphia.—p. 476.
Relation of Drainage to Morbidity Following Operation for Acute Suppurative Appendicitis. D. A. Willis and J. M. Mora, Chicago.—p. 480.
Gastrostomy: Clamp Method. V. Carabba, New York.—p. 484.
*Fractures of Neck of Femur: Method for Reduction and Fixation by Adduction. L. E. Snodgrass, Philadelphia.—p. 487.
Surgical Treatment of Ptosis of Eyelid. W. S. Kiskadden, Los Angeles. —p. 499.
Infra-Red Photography of Subcutaneous Veins. L. M. Zimmerman and H. Rattner, Chicago.—p. 502.

Diagnostic Value of Urine Diastase.—Foged believes that the diastase examination gives information in acute disorders of the pancreas. In the differential diagnosis, when it is a question of stone in the common bile duct, the positive result of the test favors this disease so strongly that at present there is no other laboratory examination which gives such sure information. There is sufficient reason to undertake diastase examinations in the following cases: (1) in all uncertain abdominal cases, especially when a pancreatic disease is suspected, (2) in diseases of the gall passages, (3) in diseases accompanied by icterus and (4) in postoperative complications, especially following operations adjacent to the pancreas. The result of a diastase analysis will not give the diagnosis immediately. The circumstances are such that a diastase reaction evaluated with understanding and linked with the clinical picture often gives a strong point for or against a definite diagnosis. The diastase examination is a laboratory examination that is simple, quickly made and inexpensive.

Jelks' Operation for Rectal Stricture.—Bacon and his associates discuss twenty-four cases of rectal stricture in which Jelks' operation was performed. The patients were symptomatically improved. Toxic phenomena were diminished and an increase in the percentage of hemoglobin and the number of red cells was noted. An increase in weight was observed in fifteen cases. At the end of nine weeks the average increase was 5¾ pounds (2.6 Kg.), at six months 9 pounds (4 Kg.), at ten months 10 pounds (4.5 Kg.), and at fourteen months 12 pounds (5.5 Kg.). Diathermy was used in five cases without apparent change. The patients who did not return to the clinic for periodic dilation showed a greater degree of subsequent contracture. Similarly, those cases in which the preoperative narrowing was marked were more prone to contract sooner and to a greater degree. Likewise the longer the stricture the greater the contraction. Patients in whom drainage continued for a period of three weeks or more showed a lesser degree of subsequent narrowing. The method consists of an anteroposterior incision, 1½ inches in length, made on either side lateral to the anus and just beyond what would correspond to the margin of the outer fibers of the external sphincter muscle. Each incision is carried to the under surface of the levator, and a closed hemostat is inserted through this muscle, opened and then withdrawn. With the finger in the rectum as a guide, a scalpel is introduced through this opening and the hard fibrous tissue on each side is severed up to and just beyond the upper limitation of the stricture. The incision is carried round the lateral sides of the rectum almost for its total circumference, except for about 1 inch posteriorly and from 2 to 2½ inches anteriorly. In twenty-one of the twenty-four cases a posterior incision was made through the entire length of the stricture for a depth of approximately one-fourth inch (stricturotomy). This was done because the lumen of the stricture was not sufficiently large after severance of the extravisceral or perirectal fibrosis. Three cases in which the posterior incision was made were complicated by hemorrhage and necessitated the use of a cautery. Each lateral wound is packed from its apex downward with iodoform gauze, and through the lumen of each stricture a small rubber tube is inserted surrounded by petrolatum gauze.

Fractures of Neck of Femur.—Snodgrass suggests the following technic for the treatment of fresh fractures of the femoral neck: Age and condition permitting, the patient is placed on a fracture table with a pelvic bar, complete anesthesia is induced and strong downward traction is applied to the injured extremity. As this traction is applied, the extremity should be in complete extension at the hip joint and in midposition between abduction and adduction. After traction has been applied, the extremities should be measured and compared as to length. The main variable factor in fracture of the hip is the direction of displacement of the head fragment. The distal fragment may be readily pulled down under anesthesia, preceded by different methods of traction, and can be placed in any position, by virtue of the fulcrum action of the iliofemoral ligament. If the direction of the head fragment is found to be in its usual position at a right angle to the acetabular rim, outward rotation of the extremity by using the foot, followed by full adduction, will reduce the fracture and obtain the final position. Strong downward traction must be maintained until the extremity reaches full adduction. If the head fragment is rotated upward and backward, as it commonly is, because of pressure from the iliofemoral ligament made tense by the weight of the femur, a different maneuver should be executed. The extremity is placed in full adduction, then externally rotated and finally pulled downward. At the same time, while an assistant holds the extremity in full extension and moderate adduction, the operator may lift upward (anteriorly) and outward on the thigh. The extremity should be in full extension of 180 degrees when the lifting is done, and the foot and ankle should be held down as the thigh is lifted upward and outward. Whichever maneuver is used, the final position should be full extension, full adduction to a point where the sagittal midline of the body may be projected downward through the knee joint, and full external rotation. The final position is followed with a plaster spica from the toes to above the pelvic brim. Success or failure depends on accurate reduction. The fragments must be brought in contact end on, even though complete apposition of both fractured areas is not obtained. The manipulative result should be checked at once by roentgenograms taken through the plaster cast. The operator has at hand two clinical tests of some value in determining the amount of reduction obtained. First, by inspection

one may note whether or not the leg rolls into extreme external rotation, after it has been moved into adduction. Second, by palpation one may note the tenseness of that portion of the fascia lata between the great trochanter and the brim of the pelvis, comparing it with the same area on the well side, when the assistant places the well leg in a corresponding position. These two tests are not diagnostic of full reduction but serve only to show that the fragments are end on. The second main factor to be observed is the elimination of all muscle pull. The adduction-external rotation method presented depends entirely on the end-to-end reduction of the fragments. This is where the emphasis must be placed if surgery is to make a real advance in the treatment of these cases.

American Review of Tuberculosis, New York

31: 261-372 (March) 1935

Architecture of Terminal Sections of Bronchi of Human Lung: Pulmonary Acinus. W. Grethmann, New York.—p. 261.
Operation of Pascal's Principle in Lungs and Pleural Cavities. E. Korol, Lincoln, Neb.—p. 299.
Precipitin Reaction to Phosphatides of Tubercle and Leprosy Bacilli. G. R. Duncan, C. C. Van Winkle, E. S. Mariette and E. P. K. Fenger, Oak Terrace, Minn.—p. 307.
*Lesions in Rabbits Following Inoculation with Bacillus Calmette-Guérin (B C G). W. H. Feldman, Rochester, Minn.—p. 323.
*Tuberculosis as Causative Factor in Addison's Disease: Report of Cases. W. A. Colton, Minneapolis.—p. 333.
*Experiments on Filtrability of Tuberculovirus. E. Piasecka-Zeyland and J. Zeyland, Poznań, Poland.—p. 346.
Progeny of Tubercle Bacillus. S. J. Maher, Shelton, Conn.—p. 350.

Lesions Following Inoculation with Bacillus Calmette-Guérin.—Feldman prepared glycerin-peptone-broth cultures using a strain of Bacillus Calmette-Guérin, obtained from Calmette in 1930 and grown for twenty generations subsequently on an egg-glycerin medium, to inoculate six rabbits intravenously and four guinea-pigs subcutaneously. One of the rabbits died ten days after inoculation and the other five were killed 174 days after inoculation. Numerous and striking focal lesions, morphologically like tubercles, were found in the lungs of each of the five rabbits. Attempts to culture acid-fast bacteria from the lesions of the lungs were futile, although bacteria of this character were readily demonstrable in appropriately stained sections of the lesions. Emulsions prepared from lesions from each of the five rabbits failed to produce demonstrable lesions in other rabbits or guinea-pigs, and attempts to repeat the results in later experiments failed. These results indicate that the Bacillus Calmette-Guérin in the lungs of rabbits may at times produce numerous and extensive tubercle-like lesions.

Tuberculosis as Causative Factor in Addison's Disease.—Colton states that of the eight cases of Addison's disease in which death occurred and postmortem examinations were made at his institution, all but two presented tuberculosis of the adrenals. The two exceptions showed amyloid degeneration of both adrenals. At necropsy, tuberculosis of the adrenals was present in twelve cases, clinical symptoms of Addison's disease being absent in six. In all of the eight cases tuberculosis was present elsewhere in the body, principally pulmonary, although three showed only arrested or healed pulmonary disease and one a moderately advanced slightly active pulmonary lesion. Genito-urinary tuberculosis was a major condition in two. The complications in these cases were: five gastro-intestinal and two bone and joint tuberculosis, two tuberculous empyema, three amyloid disease of the liver, spleen and kidneys and one hyperthyroidism. Clinically all eight presented a typical Addison's syndrome, including extreme weakness, gastro-intestinal pains (usually cramps), nausea, vomiting, headaches and loss of weight. Low blood pressure (from 90/70 to 124/80) was present in six. Unfortunately, studies of blood pressure were not complete. Two cases were not recorded. Bronzing of the skin and mucous membranes was present to a varying degree in five. There were visionary disturbances in three. Sudden collapse occurred at death in four. One showed absent reflexes of the lower limbs and one numbness of the arms and hands.

Experiments on Filtrability of Tuberculovirus.—Summarizing their observations based on the examination of 209 guinea-pigs and seventy-seven cultures, Piasecka-Zeyland and Zeyland report that their attempts to substantiate the quoted methods of demonstrating the filtrability of the tuberculous virus have given them only negative results. Comparing them with the results of other authors, they are certain that the problem of filtrability in tuberculosis cannot be decided. A critical review of the literature on this question shows that among the adherents every worker obtains positive results exclusively by his own technic and none of the described methods have given positive results in the hands of other authors not belonging to the same school; in other words, these experiments are marked by lack of ability of reproduction, and that is the main obstacle to the general acknowledgment of a fact in experimental science. The problem of the filtrability of tuberculous virus demands still further investigation with the application of new methods.

Anatomical Record, Philadelphia

61: 261-378 (Feb. 25) 1935

Preparation of Wood's Metal Casts of Lungs. A. K. Peterson, Chicago.—p. 261.
Primordial Germ Cells in 4.5 Mm. Human Embryo. G. W. D. Hamlett, Boston.—p. 273.
Study of Set of Quadruplets. A. W. Diddle and T. H. Burford, New Haven, Conn.—p. 281.
Experimental Study of Ovarian Irradiation and Transplantation in Rat. J. Mandel, New York.—p. 295.
Studies on Uterine Growth: II. Local Factor in Pregnant Uterus of Cat. J. E. Markee and J. C. Hinsey, San Francisco.—p. 311.
Normal Level of Various Cell Types in Anterior Pituitaries of Mature and Immature Rats and Further Observations on Cyclic Histologic Variations. J. M. Wolfe, Nashville, Tenn.—p. 321.
Occurrence of Pigment in Pars Intermedia and Pars Tuberalis of Hypophysis and in Hypophyseal Leptomeninges of Rat (Domestic and Wild). J. A. Benjamin Jr., Baltimore.—p. 331.
Constitution of Sheath of Rectus Abdominis Muscle. K. S. Chouke, Denver.—p. 341.
Intra-Ocular Optic Nerves in Embryos of Rana Pipiens. E. Van Campenhout, Montreal.—p. 351.
Relation of Thickness of Cutis and Subcutis to Hair Slope in Human Skin. Elizabeth Upham and W. Landauer, Storrs, Conn.—p. 359.
Improved Method for Making Dry Preparations of Vesicular Organs. C. E. Kellner, New York.—p. 367.
Age Order of Epiphyseal Union in Skeleton of European Bison (Bos Bonasus L.). W. Koch, Munich, Germany.—p. 371.

Archives of Internal Medicine, Chicago

55: 349-532 (March) 1935

Relation of Plasma Proteins to Ascites and Edema in Cirrhosis of Liver. W. K. Myers, Washington, D. C., and C. S. Keefer, with assistance of Adelaide B. Grinnan, Boston.—p. 349.
Nitrogen and Sulphur Metabolism in Bright's Disease: VI. Effect of Diets Low in Sulphur on Excretion of Sulphur. G. P. Grabfield, Boston, and L. G. Adams, Montreal.—p. 360.
Cardiovascular Status of Diabetic Patients After the Fourth Decade of Life. G. Friedman, New York.—p. 371.
*Secretion of Mucus and Acid by Stomach in Healthy Persons and in Persons with Peptic Ulcer. H. Necheles and A. Coyne, assisted by H. Gross, Chicago.—p. 395.
Diet in Chronic Arthritis. F. C. Hall, Boston, and W. K. Myers, Washington, D. C.—p. 403.
Urea Ratio as Measure of Renal Function. H. O. Mosenthal and M. Bruger, New York.—p. 411.
Thermal Study of Vasomotor Lability in Pregnancy: Preliminary Report. W. J. Dieckmann and H. L. Michel, Chicago.—p. 420.
*Estrogenic, Luteal and Gonadotropic Hormones in Hemophilia. W. B. Chew, R. P. Stetson, G. Van S. Smith and O. W. Smith, Boston.—p. 431.
Physical Constitution and Disease: II. Absence of Correlation Between Anatomic Constitution and Predisposition to Diabetes Mellitus, Cholecystitis and Peptic Ulcer. J. Feigenbaum, Boston, and D. Howat, Montreal.—p. 445.
*Electrocardiogram in Myocardial Infarction: Review of One Hundred and Seven Clinical Cases and One Hundred and Eight Cases Proved at Necropsy. A. R. Barnes, Rochester, Minn.—p. 457.
Clinical Studies in Circulatory Adjustments: I. Clinical Evaluation of Studies of Circulating Blood Volume. A. A. Goldbloom and I. Libin, with technical assistance of P. K. Roht, New York.—p. 484.

Secretion of Mucus and Acid by Stomach.—Necheles and Coyne measured the gastric secretion of visible mucus after fasting and following the injection of pilocarpine in thirty-seven normal persons and in twenty-four patients having duodenal ulcer. The amount of visible mucus in the stomach after fasting was found to be greater in normal persons more than 40 years of age than in those less than 40. This increase with age did not take place in patients having ulcer. After the injection of pilocarpine, normal persons showed an increased secretion of visible mucus, while patients having ulcer (non-drinkers and drinkers of alcohol) do not show such an increase. Normal persons who drink alcohol show a decreased secretion of mucus after the injection of pilocarpine.

Estrogenic, Luteal and Gonadotropic Hormones in Hemophilia.—The observations of Chew and his associates on two hemophiliac patients for ten and thirteen months, respec-

tively, while receiving no specific therapy and while receiving preparations of estrogenic substance by mouth and subcutaneously, the hormone of the corpus luteum intramuscularly and the gonad-stimulating hormone from the urine of pregnant women subcutaneously, indicate that persons with hemophilia have no lack of estrogenic substance in their urine and, although it does not necessarily follow, probably have no deficiency of this principle in their blood. Their observations fail to substantiate the theory that an absence of this hormone is responsible for the impaired coagulability of the blood. Conversely, they have been unable to alter the characteristic fluctuations of the prolonged coagulation time of the blood in hemophilia by the administration of estrogenic substances. The frequency with which increases in the coagulation time of the blood were associated with a demonstrable amount of the gonadotropic factors in the blood and the somewhat increased blood coagulation time in one patient while he was receiving follutein, an anterior pituitary-like gonadotropic substance, and after exposure of the pituitary region to stimulating doses of roentgen rays are observations which could be construed to indicate that the gonad-stimulating hormone of the anterior pituitary gland may contribute an adverse factor to blood clotting in hemophilia. However, the absence of demonstrable amounts of the gonadotropic factor in the blood of persons with hemophilia while a prolonged coagulation time was maintained argues against the essential importance of this factor in influencing the coagulation time. None of the various hormones exerted any fundamental influence on this sex-linked, hereditary disorder of blood clotting.

The Electrocardiogram in Myocardial Infarction.—Barnes endeavors to integrate the clinical, pathologic and experimental observations published on coronary occlusion. The site of the acute infarct in the left ventricle and not the vessel supplying the area determines the character of the electrocardiographic changes that will result. Experimental destruction of areas in the anterior portion of the left ventricle produces electrocardiographic changes that are different from those obtained by the injury of similar portions of the posterior portion of the heart. These electrocardiographic changes are a deviation of the RST segment. The preponderance of evidence is against the interpretation that deviation of the RST segment in acute myocardial infarction depends on the development of an additional factor of cardiac failure. Experimental and clinical evidence indicates that the RST deviation observed in the electrocardiogram after infarction is the primary event and that changes of the T wave are sequential and secondary to that deviation. Typically developed Q_1 and Q_3 patterns of infarction have a definite diagnostic and localizing value, and the combined consideration of the Q and T patterns will yield more information in the diagnosis than will either pattern considered alone. Under proper conditions, the presence and situation of acute infarction can be predicted almost always from the electrocardiographic changes that develop. Presumptive evidence of previous occlusion may be obtained from the appearance of inverted T waves observed months after the acute occlusion. These T waves are the coronary T waves of Pardee and are chiefly characterized by their depth and the character of the RT intervals that precede them. The reciprocal relation of T_1 and T_3, in which as one becomes more inverted the other becomes more positive, is important evidence of preceding acute occlusion. Not all RST changes observed in angina pectoris, coronary sclerosis or myocardial fibrosis are to be ascribed to coronary disease, because many of these cases present no significant electrocardiographic changes. Neither the presence nor the site of chronic dystrophic fibrosis of the myocardium is disclosed by any electrocardiographic change described to date. Electrocardiograms with low voltage of the QRS complex in all leads after acute infarction probably increase the gravity of the prognosis. The development of highly characteristic electrocardiograms of the T_1 or T_3 type after acute infarction seems to indicate a more favorable prognosis than do atypical electrocardiograms. Electrocardiographic changes signifying acute infarction may appear as early as from one to two hours after acute coronary occlusion, and the electrocardiogram may not return to normal in some instances for two or three years or more.

Archives of Pathology, Chicago

19: 139-286 (Feb.) 1935

*Hodgkin's Disease, with Especial Reference to Its Differentiation from Other Diseases of Lymph Nodes. Edith Louise Potter, Minneapolis. —p. 139.
Changes in Teeth and Bone in Chronic Fluoride Poisoning. C. J. Sutro, New York.—p. 159.
*Effect of Resection of Large Fractions of Renal Substance: Experimental Study. R. B. Allen, New York; J. L. Bollman and F. C. Mann, Rochester, Minn.—p. 174.
Periappendicitis Without Appendicitis: Study Based on Twenty-Six Thousand and Fifty-One Appendixes. H. Gordon, Ann Arbor, Mich. —p. 185.

Hodgkin's and Other Diseases of Lymph Nodes.—Potter divides pathologic conditions of lymph nodes into two groups: those secondary to disease elsewhere in the body and those in which lymphoid tissue is the structure primarily involved. The first group includes simple hyperplasia, acute and chronic inflammation and metastatic tumor infiltration. The second group includes the leukemias and reticulo-endotheliosis, the various types of lymphosarcoma, reticulo-endothelial sarcoma, endothelioma and Hodgkin's disease. In all diseases primary in lymph nodes, reticulo-endothelial tissue of any part of the body may be involved. These diseases involve primarily the undifferentiated reticulum cells, those cells which show no differentiation into either sinus endothelium or phagocytic cells. Leukemia is the result of a stimulation of the hematopoietic function of reticulum cells. There is an abnormal proliferation of reticulum cells, most of which develop rapidly into hemocytoblasts. Sarcoma of reticulo-endothelial tissue also results from abnormal proliferation of undifferentiated reticulum cells. There is an entirely unsuccessful attempt to form mature cells, although there may be slight differentiation into hemocytoblasts, endothelium of sinuses or simple reticulum cells. In Hodgkin's disease there also is a proliferation of reticulum cells. There is a development of reticulum cells along all lines normally followed, plus the formation of various types of abnormal cells. After proliferation the reticulum may remain as normal syncytial cells; they may become more completely fused and solidly packed and resemble endotheliomatous tissue; they may increase in size and develop more hyperchromatic nuclei while still retaining their syncytial character and resemble somewhat the cells of retithelioma, and they may develop into the specific type of mononuclear or polymorphonuclear cells that are characteristic of Hodgkin's disease. In addition they may develop into normal hemocytoblasts, normal fixed or free phagocytes, or fibroblasts. There is always a protean type of cellular differentiation. Hodgkin's disease is always characterized by pleomorphism of cells. The microscopic appearance of Hodgkin's disease depends on the relative predominance of certain developmental tendencies. A definite diagnosis of Hodgkin's disease cannot be made without the presence of specific Hodgkin cells. Hodgkin's disease may be subdivided according to the predominant cells (endotheliomatous, reticular, cellular, sclerotic). If there is no cellular variety and if Hodgkin cells are absent, the condition must be called "endothelioma," "lymphosarcoma" or "reticulum cell hyperplasia." Hodgkin cells are occasionally absent from individual nodes, even when present in the majority. Since all the diseases primary in lymph nodes may show reticulum cell proliferation, the presence of hyperplasia of these cells alone is insufficient evidence for making any specific diagnosis. In each disease primary in lymph nodes there is development along a specific line. In rare atypical cases the stimulus ordinarily producing a specific histologic change may lead to the formation of the type of tissue ordinarily produced by another cause and associated with another disease. The microscopic pictures of all diseases primary in lymph nodes may, in rare instances, in individual nodes, be identical, with the exception that Hodgkin's cells are never found except in Hodgkin's disease. Hodgkin's disease, the sarcomas arising from reticulo-endothelium and the leukemias and aleukemias represent three distinct entities.

Resection of Large Fractions of Renal Substance.—Allen and his co-workers subjected eight dogs, aged from 5 to 6 months, to resection of large fractions of renal substance; the largest fraction was not less than three fourths. After an interval of several months the degree and nature of the hypertrophic response in different animals of a litter were made.

Transitory increases occurred in the concentration of blood urea following resection, but as little as one fourth of the renal substance was capable of maintaining a normal concentration. Readings of the blood pressure (indirect and direct) were normal. In one animal nearly three fourths of the renal substance (72.8 per cent) was removed at one operation, and the animal survived. In another animal somewhat more than three fourths of the renal substance was removed in two stages by waiting for compensatory hypertrophy to occur in the interval, and the animal survived. Evidence is presented which indicates that the larger the proportion of total renal substance resected (but not in excess of approximately 70 per cent) the greater is the relative hypertrophy that occurs, both in terms of the mass of the kidney and in terms of the size of the renal corpuscles and tubules. These observations suggest that compensatory renal hypertrophy is a physiologic or work reaction.

Arkansas Medical Society Journal, Fort Smith

31: 167-190 (March) 1935

The Knee Joint. F. W. Carruthers, Little Rock.—p. 167.
Effect of Postural Changes on Blood Pressure and Pulse Rate. C. H. Lutterloh, Hot Springs National Park.—p. 172.

Delaware State Medical Journal, Wilmington

7: 21-40 (Feb.) 1935

Insanity: Some Medicolegal Aspects. D. J. Layton, Georgetown.—p. 21.
Science of Medical Superstition. C. A. D'Alonzo, Wilmington.—p. 29.

Journal of Allergy, St. Louis

6: 215-310 (March) 1935

Studies in Mucous Membrane Hypersensitiveness: I. Passive Local Sensitization of Ophthalmic Mucous Membrane. M. Walzer, H. Sherman and L. A. Feldman, Brooklyn.—p. 215.
Pollen Carbohydrate as Therapeutic Agent for Pollen Asthma: Preliminary Report. A. H. W. Caulfeild, Toronto.—p. 219.
Further Observations Concerning Effect of Pollen Therapy on Cutaneous Sensitiveness in Late Hay Fever. H. Markow and W. C. Spain, New York.—p. 227.
Protein Content of Extracts of Various Allergens: Methods for Determining Small Amounts of Protein. R. S. Hubbard and H. Osgood, with technical assistance of Helen R. Garbutt, Buffalo.—p. 231.
Ionization of Nasal Mucosa: Relationship Between Reagins in Blood and Effect of Treatment: Preliminary Report. H. L. Alexander and J. H. Alexander, St. Louis.—p. 240.
New Method of Preparation of Pollen Extracts. J. M. Anderson, Salt Lake City.—p. 244.
Normergic and Allergic Inflammation. B. S. Kline and A. M. Young, Cleveland.—p. 247.
Reversible and Irreversible Allergic Inflammation: Cases. B. S. Kline and A. M. Young, Cleveland.—p. 258.
*Treatment of Chronic Atrophic Arthritis with Autogenous Streptococcus Filtrates (Antivirus): Preliminary Report. A. E. Lamb, G. E. Anderson and L. Nerb, Brooklyn.—p. 273.
Studies on Relation of Adrenal Glands to Allergic Phenomena: III. Specific Therapeutic Effects of Cortical Adrenal Extract in Asthma. M. B. Cohen and J. A. Rudolph, Cleveland.—p. 279.
Histamine and Typhoid Protein Compared in Control of Asthma and Hay Fever. N. F. Thiberge, New Orleans.—p. 282.
Honey Dew from Live Oak Cause of Hay Fever and Asthma. G. H. Fondé and E. C. Fondé, Mobile, Ala.—p. 288.
Cutaneous Allergy Following Ingestion of Amidopyrine. A. E. Taussig, St. Louis.—p. 291.
*Psoriasis as Possible Allergic Manifestation. W. B. Adamson, Abilene, Texas.—p. 294.
Climacteric Hypersensitiveness to Sun and Effort: Treatment with Follicular Hormone (Theelin): Preliminary Report of Case. M. M. Goldberg, New Orleans.—p. 298.
Orris Root Fingers. L. E. Prickman, Rochester, Minn.—p. 302.

Treatment of Atrophic Arthritis.—Lamb and his associates state that there is no definite evidence that atrophic arthritis is caused by any one specific type of streptococcus. The evidence seems to indicate that the disease results from the effect of different types of streptococcus localized in varied foci of infection. It is likely that the reaction in the joints to the products of these organisms is an allergic one. In support of this it has been demonstrated that cases of atrophic arthritis will react with a positive skin test to filtrates prepared from the strains of streptococci isolated from their own foci of infection. It is to be emphasized that bacterial filtrates and not vaccines are to be prepared for skin test and therapy. Of the patients having atrophic arthritis treated by desensitization to autogenous streptococcus bacterial filtrates (antivirus) to which they showed a positive skin test, 84.3 per cent improved, whereas only 48.4 per cent of the patients treated with autogenous streptococcus vaccine showed improvement.

Psoriasis as Possible Allergic Manifestation.—To investigate the question of an antigenic factor in the scales of psoriasis lesions, Adamson collected scales with a minimal admixture of blood, serum or other foreign substances. The lipoids were removed with two washings in ether and the dried scales were pulverized in a mortar. Three types of extracting fluid were used: physiologic solution of sodium chloride, buffered saline solution and alkaline saline solution. The latter yielded the most satisfactory extract. Five grams of the pulverized scales were placed in 100 cc. of the extracting fluid and kept in the icebox for five days. The extract was then passed through a Seitz filter and proved by cultural method to be sterile. Chemical analysis revealed a nitrogen content of 0.395 mg. per cubic centimeter. This product was slightly irritating to the normal skin; therefore dilutions 1:4 and 1:8 with respective normal contents of 0.1 and 0.05 mg. per cubic centimeter were made. Intradermal injection of these two dilutions gave negative reactions in ten normal skins. Six cases of psoriasis were available and in each case positive reactions occurred at the sites of the intradermal injection of 0.02 cc. of the weaker dilution. Atopic reagins in the blood were not demonstrable by passive transfer, nor were precipitins demonstrable in vitro.

Journal of Infectious Diseases, Chicago

58: 1-96 (Jan.-Feb.) 1935

Is a Special Variety of Staphylococcus Concerned in Food Poisoning? J. Stritar and E. O. Jordan, Chicago.—p. 1.
Grouping of Monilias by Fermentation and Precipitin Reactions. J. H. Lamb and Margaret Lain Lamb, Oklahoma City.—p. 8.
Experimental Rabies in White Mice and Attempted Chemotherapy: II. A. Hoyt, R. T. Fisk and C. H. Thienes, Los Angeles.—p. 21.
Tularemia in Wild Gray Foxes: Report of an Epizootic. C. F. Schlotthauer, L. Thompson and C. Olson Jr., Rochester, Minn.—p. 28.
*The Passage of Bacteria from Lungs into Blood Stream. W. M. Tuttle and P. R. Cannon, Chicago.—p. 31.
Influence of Bovine Serum on Brucella Infection in Guinea-Pigs. B. A. Beach, Madison, Wis.—p. 38.
Purification of Suspensions of Virus of Vaccinia (Iso-Electric Point Method). C. A. Behrens and F. A. Nielsen, Lafayette, Ind.—p. 41.
Specificity of Conjunctival Infection in Monkeys Following Inoculation with Trachomatous Tissue. R. W. Harrison, St. Louis.—p. 49.
Spontaneous Occurrence of Brucella Agglutinins in Dogs. W. H. Feldman, F. C. Mann and C. Olson Jr., Rochester, Minn.—p. 55.
Coccus Forms of Corynebacterium Diphtheriae. T. C. Grubb, Chicago.—p. 64.
Pathogenicity for Cattle of Brucella Strains Isolated from Cases of Undulant Fever in Man. R. R. Birch and H. L. Gilman, Ithaca, N. Y.—p. 78.
*Preservation of Purified Suspensions of Virus of Vaccinia. C. A. Behrens and W. W. Ferguson, Lafayette, Ind.—p. 84.
The Lesions Produced in Uterus of the Guinea-Pig by Injections of Suspensions of Hemolytic Streptococci and Pyocyaneus Bacillus at Different Stages of the Sexual Cycle. C. S. Linton, A. A. Kippen and L. Loeb, St. Louis.—p. 89.

The Passage of Bacteria from Lungs to Blood Stream.—Tuttle and Cannon introduced bacterial suspensions of Staphylococcus aureus, Bacillus prodigiosus and Streptococcus haemolyticus into the left lower lobe of the lungs in fourteen healthy dogs and took cultures of samples of blood from the femoral artery and lymph from the thoracic duct at frequent intervals during the first sixty minutes. In the animals injected with staphylococci and prodigiosus bacilli both the blood and the lymph remained sterile throughout the period of observation. The bacteria were demonstrable in the lungs at the end of the experiment, many already engulfed by septal cells. In the dogs injected with hemolytic streptococci the micro-organisms quickly entered the blood stream, whereas the thoracic lymph remained sterile in most instances, proving that the bacterial passage from the lungs into the blood stream was direct, rather than indirect by way of the lymphatic channels. It is probable that the differences in response of the pulmonary tissues to the micro-organisms employed depend to a large extent on the varying degrees of injury to the cellular and tissue barriers within the lungs and that the experimental bacteremia occurred because of increased permeability of these membranes induced by the virulence and toxicogenicity of the bacteria.

Preservation of Purified Suspensions of Virus of Vaccinia.—Behrens and Ferguson tested the stability of a virus free of protective organic cellular matter and observed the effect of various substances when stored under like conditions. The viruses that they employed were dermovirus, obtained from commercial calf pulp, and neurovirus, obtained from the

original Levaditi strain, which was cultivated in vivo in rabbits. Suspensions of these viruses were made up with physiologic solution of sodium chloride and purified by the iso-electric point method and by the use of Brewer-Kraybill aluminum gel. They found that of the preservatives tested gelatin and peptone gave the best protection to the virus, when used in percentages of 0.1 and 1, respectively.

Journal of Pharmacology & Exper. Therap., Baltimore

53: 139-250 (Feb.) 1935

Effect of Tribrom-Ethanol (Avertin) on Electric Changes in Human Heart. W. R. M. Morton, Belfast, Ireland.—p. 139.
Tension Output of Caffeinized Muscles. G. Saslow and E. C. Webster, Woods Hole, Mass.—p. 142.
Effect of Morphine on Oxygen Consumption of Brain Tissue in Rat. E. G. Gross and I. H. Pierce, Iowa City.—p. 156.
Mechanism of Action of Strychnine on Respiration. Janet Travell and H. Gold, New York.—p. 169.
Method for Testing Addiction, Tolerance and Abstinence in Rat: Results of Its Application to Several Morphine Alkaloids. C. K. Himmelsbach, G. H. Gerlach and E. J. Stanton, Cleveland.—p. 179.
Bicarbonate Elimination Through Salivary Glands Under Nervous and Chemical Stimulation. H. H. McClanahan Jr., University, Miss., and W. R. Amberson, Memphis, Tenn.—p. 189.
Anthelmintic Studies on Alkylhydroxybenzenes: I. Alkylpolyhydroxybenzenes. P. D. Lamson, H. W. Brown and C. B. Ward, Nashville, Tenn.—p. 198.
Id.: II. Ortho-Alkylphenols and Para-n-Alkylphenols. P. D. Lamson, H. W. Brown, R. W. Stoughton, P. D. Harwood, R. Baltzly and A. Bass, Nashville, Tenn.—p. 218.
Id.: III. 6-N-Alkyl-Meta-Cresols. P. D. Lamson and H. W. Brown, Nashville, Tenn.—p. 227.
Id.: IV. Isomerism in Polyalkylphenols. P. D. Lamson, H. W. Brown, R. W. Stoughton, P. D. Harwood, R. Baltzly and A. Bass, Nashville, Tenn.—p. 234.
Id.: V. Phenols with Other Than Normal Alkyl Side Chains. P. D. Lamson, H. W. Brown, R. W. Stoughton, P. D. Harwood, R. Baltzly and A. D. Bass, Nashville, Tenn.—p. 239.

Maine Medical Journal, Portland

26: 31-44 (March) 1935

Traumatic Surgery of the Hand. S. A. Cobb, Sanford.—p. 33.
Routine Hospital Laboratory Examinations: II. Hematology. M. Warren, with assistance of Wilhelmina Abdullah, Portland.—p. 36.

Minnesota Medicine, St. Paul

18: 131-200 (March) 1935

*Ten Years of Surgery for Cancer of Breast. W. A. Coventry and R. J. Moe, Duluth.—p. 131.
Treatment of Severe Essential Hypertension: Effects of Surgical Procedures Applied to Sympathetic Nervous System. G. E. Brown, W. M. Craig and A. W. Adson, Rochester.—p. 134.
Disturbances in Peripheral Circulation: Clinic in Medicine. G. E. Brown, Rochester.—p. 139.
Insomnia. G. R. Kamman, St. Paul.—p. 143.
Attempted Suicide: Investigation of One Annual Series in the Minneapolis General Hospital. J. C. Michael and B. P. Grimes, Minneapolis.—p. 148.
Multiple Areas of Cutaneous Gangrene Following Scarlet Fever: Report of Case. S. E. Sweitzer and C. W. Laymon, Minneapolis.—p. 154.

Surgery for Cancer of Breast.—From 1919 to and including 1928 Coventry and Moe operated on ninety-one patients with carcinoma of the breast. Twenty-four are living and well. Two are living with recurrence. Sixty-one are dead and four are untraced, thus making 26.3 per cent of so-called five-year cures. The average duration of symptoms in the entire group was 11.2 months from the time the symptoms were first noticed until the operation was performed, while in the groups of five-year cures the average duration of symptoms was only four months and in the seven and ten year groups it was still less. This observation impresses the fact that early diagnosis and early treatment are of primary importance. Of the twenty-four patients living and well five years or more, twenty-one had radical operations and three had semiradical procedures. Mere amputation or excision of the tumor produced no five-year cures. Roentgen treatment was given to eleven of the twenty-four patients, while no radiation was given to thirteen. The duration of symptoms, size of growth and presence of metastasis played no apparent part in the end results, as approximately an equal number of early and late cases were found in the two groups. The authors firmly believe that the radical operation as advocated by Halsted and Meyer is the most effective weapon at hand in combating this disease. A lump in the breast demands biopsy. There is a need for a cooperative program between the surgeon and the radiologist to assure the administration of proper and effective dosage.

Missouri State Medical Assn. Journal, St. Louis

32: 81-124 (March) 1935

Diet in Health and Disease. J. H. Musser, New Orleans.—p. 81.
Unusual Pyogenic Osteomyelitis: General Discussion and Review of One Hundred and Thirty-Eight Spine and Pelvic Lesions. J. Kulowski, St. Joseph.—p. 85.
Bladder Catheterization: Its Benefits and Dangers in Prostatic, Postoperative, Postpartum and Neurogenic Obstructions. D. K. Rose, St. Louis.—p. 94.
Management of Hyperthyroidism. E. V. Mastin, St. Louis.—p. 98.
The Diphtheria Problem in St. Louis. E. Sigoloff, St. Louis.—p. 103.

Virginia Medical Monthly, Richmond

61: 685-736 (March) 1935

*New Conception of Pellagra. B. R. Tucker, Richmond.—p. 686.
Progress of Surgery During Last Forty Years. G. T. Vaughan, Washington, D. C.—p. 690.
Calcium: Its Metabolism and Deficiency as Rhinologic and Otolaryngologic Problem. H. G. Preston, Harrisonburg.—p. 694.
Management of Diabetic Patients in Private Practice. W. R. Jordan, Richmond.—p. 697.
Sodium Hydrosulphite in Treatment of Poisoning by Mercuric Chloride. C. C. Haskell, G. F. Cormeny and S. S. Hamilton, East Orange, N. J. —p. 703.
Study of Convulsive Disorders at the University of Virginia Hospital Since 1920. F. A. Strickler, University.—p. 706.
Music and Health. E. Podolsky, Brooklyn.—p. 710.
Anaphylaxis Following Administration of Pituitrin. H. G. Byrd, Louisa.—p. 713.
Cardiac Nomenclature: Unsatisfactory Terms. W. A. Plecker, Richmond.—p. 714.

New Conception of Pellagra.—Tucker believes that dietary deficiency, including that of vitamin G, probably contributes to the susceptibility to pellagra, and so in a lesser degree do chronic alcoholism, chronic tuberculosis, chronic digestive disturbance, prolonged mental states and morphinism. In his experience many patients have recovered without yeast, liver or much food supposed to be rich in vitamin G. Inquiry from six Southern state hospitals reveals that the superintendents of four reported the development of pellagra in patients on the so-called pellagra preventive diet. In considering the possibility of a virus infection as the cause of pellagra he points out that pellagra resembles acute anterior poliomyelitis, smallpox, herpes zoster, influenza and the form of encephalitis that follows influenza in its epidemiology, place incidence, seasonal tendency and its acute, chronic and recurrent forms much more than it does scurvy, rickets, beriberi, malnutrition and other dietary deficiency diseases. But the pathology is the most important factor pointing to the possible cause of pellagra. In two brains, six cords and two sympathetic ganglionic chains examined by the author pellagra was found to affect the brains but slightly, the cords diffusely and especially in the cervical and lumbar enlargements, and the spinal sympathetic ganglionic chains extensively. He was led to the conjecture that a virus would be the most likely agent to cause this neuropathologic distribution. In support of the contention that the pathology of pellagra is chiefly neurologic, he calls attention to the literature of necropsies of the central nervous system. Reflex and other organic neurologic signs are found in probably 25 per cent of pellagra patients and mental symptoms are, of course, not infrequent. Organic neurologic signs and mental symptoms are common to practically all very severe cases. Involvement of the spinal cord will account for the organic neurologic signs, while a general toxemia with, at times, infiltration to the brain will account for the psychoses and involvement of the spinal ganglionic sympathetic chain with its spinal cord connections for the cutaneous and gastro-intestinal manifestations. A filtrable virus is the most likely cause of such distribution of involvement.

Wisconsin Medical Journal, Madison

34: 153-220 (March) 1935

Cardiac Pain: Differentiation of Genuine Cardiac Pain from Conditions Simulating It. F. D. Murphy, Milwaukee.—p. 163.
Spontaneous Subarachnoid Hemorrhage: Report of Twelve Cases. Mabel G. Masten, Madison.—p. 168.
Drug Hypersensitivity as Cause of Acute Primary Granulocytopenia. T. L. Squier and F. W. Madison, Milwaukee.—p. 175.
Complete Dissolution of Large Renal Calculus. W. M. Kearns, Milwaukee.—p. 179.
Abnormal Positions of Kidneys. W. G. Sexton, Marshfield.—p. 184.
Unilateral Postencephalitic Parkinsonian Syndrome: Report of Two Cases. E. M. Jordan, Green Bay.—p. 185.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 401-456 (March 2) 1935

Circulatory Diseases of Extremities. J. Fraser.—p. 401.
Relationship of Jochmann's and Other Enzymes to Encephalitogenic Agent in Lymphadenomatous Lymphatic Glands. I. MacKenzie and C. E. Van Rooyen.—p. 406.
Serologic Diagnosis of Weil's Disease. H. C. Brown.—p. 411.
Heredity and Mental Deficiency. J. A. F. Roberts.—p. 413.
Repair of Perineal Tears: Simple Technic. J. Melvin.—p. 415.

Glasgow Medical Journal

5: 49-112 (Feb.) 1935

Some Pages from History of Prevention of Malaria. M. Watson.—p. 49.
Basis of Standard Tables of Body Weight. P. L. McKinlay.—p. 71.

Indian Medical Gazette, Calcutta

70: 61-120 (Feb.) 1935

Corneal Transplantation on Opaque Corneas. E. O'G. Kirwan.—p. 61.
*Relationship Between Quinine Concentration in Circulating Blood and Parasite Count in Monkey Malaria. R. N. Chopra, S. K. Ganguli and A. C. Roy.—p. 62.
Venereal Origin of Granuloma Inguinale. T. B. Menon and P. Natesan.—p. 66.
Effect of Use of Living or Dead Suspensions of Vibrios on Agglutination Titer. R. W. Linton and S. C. Seal.—p. 68.
Observations on Vitamin A Value of Halibut Liver Oil. B. Ahmad.—p. 70.
Values of Constants in Analysis of Ghi for Detection of Adulteration. B. B. Brahmachari.—p. 71.
Simple Method of Bug Destruction. J. N. Pacheco.—p. 75.

Relation Between Quinine Concentration and Malaria Parasite Count.—Chopra and his associates performed experiments on monkeys to determine whether with the maximal concentration of quinine obtained in the blood the parasites exhibited any tendency to increase or decrease in number or to show degenerative changes. Silenus rhesus monkeys were infected with strains of Plasmodium Knowlesi from another infected monkey, and the erythrocyte and the corresponding parasite counts were determined. Quinine was then administered by the intramuscular or the intravenous route, and the concentration of the alkaloid in the blood and parasite counts were determined at intervals. There was no direct relationship between the concentration of quinine in the blood and the parasite count at any particular time. The highest concentration of the alkaloid attainable without producing too severe toxic effects produces no apparent reduction in the number of parasites or degenerative changes in them. On the other hand, in the majority of cases there was a definite apparent increase in the number of parasites per cubic millimeter of blood after the administration of quinine. The action of quinine on the parasites does not appear to be direct but is probably synergistic to other mechanisms set up in the body. It has been observed that once the number of parasites approximates one million per cubic millimeter no amount of quinine, however administered, is of any avail.

Journal of State Medicine, London

43: 125-186 (March) 1935

Economic Possibilities of Scientific Nutrition. R. G. Linton.—p. 125.
The Future of Preventive Medicine. A. Cox.—p. 132.
The Canning of Fresh Fruit and Vegetables in Relation to Health. T. Rendle.—p. 145.
Unification of Control of Animal Diseases and of Meat and Milk Supply. W. T. MacGregor.—p. 156.
Young Farmers' Clubs: Their Relation to Veterinary and Public Health. J. C. Leslie.—p. 166.
Tudor Marriages and Infantile Mortality. C. C. Morrell.—p. 173.
The Care of the Advanced Consumptive. F. R. G. Heaf.—p. 182.

Journal of Tropical Medicine and Hygiene, London

38: 41-52 (Feb. 15) 1935

Devitalized Vital Statistics in the Tropics: Being Plea for Revision of Some Existing Practices. P. G. Edge.—p. 41.
Further Observations on Francolin and Guinea-Fowl as Reservoirs of Trypanosoma Rhodesiense. J. F. Corson.—p. 46.

38: 53-64 (March 1) 1935

Experimental Transmission of Lymphogranuloma Inguinale to Guinea-Pigs. W. E. Coutts and J. M. Herrera.—p. 53.
Diagnosis of Ascariasis. R. Girges.—p. 55.

Lancet, London

1: 419-472 (Feb. 23) 1935

Place of Surgery in Treatment of Peptic Ulcer. W. H. Ogilvie.—p. 419.
*Renal Sympathectomy and Renal Sympatheticotonus: Scope and Limitations of Operation. S. H. Harris.—p. 424.
Sinusitis in Mental Disorder. D. N. Parfitt.—p. 429.
Relative Food Values of Glucose and Sucrose (Cane Sugar). S. W. Cole.—p. 431.
*Use of Prostigmine in Treatment of Myasthenia Gravis. E. A. B. Pritchard.—p. 432.

Renal Sympathectomy and Renal Sympatheticotonus.—Harris issues a warning against the promiscuous application of renal sympathectomy. He has limited its field of application and has in no case employed it in conjunction with nephropexy or decapsulation. It has been carried out solely for relief of the pain of increased intrarenal tension in cases of urinary stasis arising from neuromuscular dysfunction of the renal pelvis, calices and upper portion of the ureter—a definite type of obstructive nephropathy (renal sympatheticotonus). Renal sympathectomy may be employed in cases of this type with a certainty of success that is exceeded by few other operations. Of the etiologic factors concerned, little or nothing definite is known. The disease rarely attacks people in robust health. Worry and overwork have been features in nearly all cases. The attacks of pain are believed to be brought about by increased excitability of the sympathetic nerve supply to the kidney, though this sympathetic overactivity, while commonly unilateral, may often be shown to be much more comprehensive in its distribution. Evidence of this is to be found in muscular hypertonus, illustrated by increased excitability of the knee jerk on the affected as compared with the normal side, with delayed relaxation time and absence of the normal oscillations. Hypertonus, as estimated by the knee jerk, is liable to variation from time to time in the same patient and is subject at the time of examination to the phenomenon of fatigue. Attention should be focused on the first tests made, and the patient should be properly prepared. It is reasonable to suppose that this periodic variation of hypertonicity also applies to the kidney, affecting the entire musculature. The intermittent nature of the pain would thus find a ready explanation. The renal stasis as exemplified by the delayed emptying time of the renal pelvis after pyelography is constantly found. The three stages of renal sympatheticotonus are irritability or overexertion, exhaustion and dilatation or paralysis. In the first stage systole predominates, in the second diastole, and in the third hydronephrosis is present. Immediate and permanent relief of symptoms is afforded by renal sympathectomy in stages one and two. In stage three the aid of plastic surgery may be necessary to overcome secondary organic obstruction. The author believes that the best interests of surgery in general and of renal sympathectomy in particular will be conserved by rigidly confining the operation of renal sympathectomy to the type of case described.

Use of a Derivative of Physostigmine in Treatment of Myasthenia Gravis.—Pritchard confirms the clinical effects of dimethyl carbamic ester of hydroxy phenyl-tri-methyl ammonium methyl sulphite in the treatment of myasthenia gravis obtained by Walker. Of the seven cases described, all have shown a striking and immediate relief of symptoms to a degree not observed with any other remedy. Each of the seven patients has been examined before and after the injection into the buttock of the physostigmine derivative and atropine. The atropine is given to counteract the effect of the physostigmine derivative in causing slowing of the heart and peristalsis of the intestine. In each a measure of the maximal power of voluntary flexion of the fingers before and after has been obtained by means of a recording dynamometer. The effect of the injections has passed off almost completely in eight hours. A further injection resulted in recovery as before. A control injection with sodium chloride, after previous injection of the derivative of physostigmine—so that the patient was expecting a good result—gave only slight improvement in the hand grasps and no other symptomatic improvement. In the three patients in whom myographic registration has been possible, this clinical remission of symptoms has coincided with a change in the curve of tension developed under electrical stimulation from the form characteristic of myasthenia gravis to the normal form.

1: 473-530 (March 2) 1935

Physical Aspects of Psychologic Disease. A. Abrahams.—p. 473.
*Surgery of the Lung Root. L. O'Shaughnessy.—p. 476.
*Toxic Diphtheria: Significance of Sugar Tolerance Curves and Value of Insulin. N. D. Begg, note by E. H. R. Harries.—p. 480.
Experimental Endometrial Hyperplasia. A. S. Parkes.—p. 485.
Disturbance of Cerebral Function in Concussion. C. P. Symonds.—p. 486.
Pernicious Anemia: Review of Fifty-Six Hospital Cases. J. Mills and R. Herring.—p. 488.
Lead Encephalopathy: Case. K. C. Eden.—p. 490.

Surgery of the Lung Root.—O'Shaughnessy outlines the following lesser known interventions on the lung root that he believes will have an increasing importance in radical or palliative treatment: exposure of the lung root, operation on the bronchus, operation on the pulmonary artery and veins and surgery of the nerves of the lung root. It is believed that most of these interventions have a purely theoretical basis—that none of them have been performed often enough to enable a true judgment—and that the surgery of the lung root has no real practical basis. On the other hand, four years ago it was the common opinion that total extirpation of the lung was a purely experimental procedure: many animals had survived, but no men, and the operation was never attempted. Since 1931, when Nissen demonstrated that extirpation was a practical proposition, the operation has been attempted more often. In a recent paper Archibald states that he has records of twenty-three cases with sixteen successes, and these figures do not include Mason's two successful English cases. This record seems to justify the pursuit of the less radical surgery of the lung root in the hope that some help may be given to that large group of sufferers from chronic disease of the lung for whom conservative therapy fails to provide even symptomatic relief.

Sugar Tolerance Curves in Diphtheria.—In 124 cases of severe diphtheria graded according to Bie's classification of extent of membrane, Begg estimated the sugar tolerance curves at various stages of the disease; all the patients received intravenous and intramuscular antitoxin and dextrose intravenously and orally and half of them received, in addition, insulin in doses depending on the sugar tolerance tests. To avoid bias in selection, alternate cases within the same age periods and clinically of the same degree of severity were placed in the insulin and control groups respectively. As far as the author's data are concerned, the efficacy of insulin in the treatment of diphtheria cannot be demonstrated. The response of the body to intravenous dextrose is constantly abnormal and results in higher blood sugar tests. The degree of variation is a sensitive index of the severity of the attack and serves as a reliable guide to the progress of the disease. A fairly close association appears to exist between abnormalities in tolerance curves and involvements of the cardiovascular mechanism. How much the former depend on the latter it is impossible to say. Insulin does not appear to change the character of the abnormal curves or to influence the course of the disease, as judged by the fatality and complication rates.

Medical Journal of Australia, Sydney

1: 197-230 (Feb. 16) 1935

Lymphadenoma. H. Ritchie.—p. 197.
Hodgkin's Disease. G. F. S. Davies.—p. 199.

1: 231-262 (Feb. 23) 1935

Modern Treatment of Diabetes Mellitus. S. R. Burston.—p. 231.
Tuberculosis Today and Australia's Opportunity. A. R. Southwood.—p. 239.
The Case of Lady Flora Hastings. C. Macdonald.—p. 241.
Inhibition of Mitotic Activity by X Radiations of Different Qualities. W. H. Love.—p. 247.

1: 263-294 (March 2) 1935

Lister: Some Aspects of His Life, Work and Character. H. Newland.—p. 263.
The X-Ray Examination of the Appendix. D. G. Maitland.—p. 270.
Contribution to Study of Heredity of Blood Groups in Australian Families. Eva A. Shipton.—p. 273.
*Autohemotherapy in Treatment of Bronchial Asthma. K. Maddox and R. Back.—p. 277.

Autohemotherapy in Treatment of Bronchial Asthma.—Maddox and Back employed autohemotherapy in the treatment of bronchial asthma in twenty-four children less than 16 years of age, seventeen adults, all of whom, except two, were less than 40 years of age, and two typical examples of vasomotor rhinitis. After a thorough examination, 10 cc. of blood was taken from the median basilic vein and injected forthwith into the buttock without admixture of citrate or any attempt to separate the blood elements. This was repeated five times at intervals of a week. The patient then entered on a period of observation varying from three to twelve months. Any beneficial results obtained were directly proportional to the youth of the patient, and therefore to the less complicated character of the asthma. The purer the allergy, the better were the results obtained from the injections. Young asthmatic patients constituted by far the greater part of those patients showing improvement, and in approximately three fourths of the children the frequency of the attacks was appreciably reduced, while in every instance some alleviation in severity was manifest. Hemotherapy was more successful in children of the first decade than in those of the second. The presence of skin sensitivity to the scratch method presaged a better result from autohemotherapy: the average age of onset of asthma in this series was no earlier in children with a family history of the disease.

South African Medical Journal, Cape Town

9: 65-96 (Feb. 9) 1935

Transurethral Surgery of Prostate and Bladder Neck: Study of Fifty-Five Cases. R. S. Verster.—p. 67.
Enuresis. A. E. Strawbaun.—p. 75.
Periosteal Flap Grafts in Mastoid Operations. O. Popper.—p. 77.
Sputum in Pulmonary Tuberculosis. S. S. Hewitt.—p. 79.

Tubercle, London

16: 241-288 (March) 1935

Intrathoracic Tuberculosis Among Chinese, with Especial Reference to the Province of Szechuan. H. G. Anderson.—p. 241.
*Bactericidal Power of Blood Serum as Means of Differentiating a Certain Type of Pulmonary Tuberculosis. W. Pagel.—p. 256.
Surgical Unit in a Sanatorium. J. B. McDougall and N. D. Bardswell.—p. 267.

Bactericidal Power of Blood Serum in Tuberculosis.—Pagel draws the following conclusions from his investigations on the bactericidal power of the blood serum in seventy cases of pulmonary tuberculosis: 1. There are a certain number with a definite power of the blood serum to prevent or diminish the growth of tubercle bacilli. This result agrees with that of the fundamental experiments of Courmont and Gardère. 2. On the other hand, the statement of Kirchner is confirmed that glycerin broth, as such, is not a suitable culture medium but is rendered a good medium by the addition of normal serum. This is the basis of a simple technic for proving the preventive power of certain serums of tuberculous patients in a regular and uniform manner. 3. In spite of the fact that the majority of the author's cases with a high bactericidal power of the serum showed healing processes, it does not seem to him that the preventive power of the serum is due to the clinical state and extent of a tuberculosis but to its peculiar type of development. Such cases are not confined to tuberculosis of the skin (in which form Kallós and Nathan have proved the bactericidal power in an instructive manner) but belong to the universal complex of the chronic hematogenic tuberculosis of the lung. 4. The frequent occurrence of early pulmonary infiltrations in this group with a high bactericidal power of the blood serum may be a hint as to the hematogenic origin of such infiltrations. Whether the bactericidal power of the blood serum in cases of this type is connected with the content of antibodies, beta tuberculin (Kallós) or tryptophan in the blood serum, as indicated in cases of tuberculosis of the skin by Kallós and Nathan, has to be proved by further investigations.

Chinese Medical Journal, Peiping

49: 1-100 (Jan.) 1935

Calcium and Phosphorus Metabolism in Osteomalacia: II. Further Studies on Response to Vitamin D of Patients with Osteomalacia. S. H. Liu, R. R. Hannon, H. I. Chu, K. C. Chen, S. K. Chou and S. H. Wang.—p. 1.
Cleft Palate. P. C. Tung.—p. 22.
Examination of Feces for Ova of Schistosoma Japonicum. Mary N. Andrews.—p. 42.
Modern Conception of Osteomalacia and Its Importance to China. J. P. Maxwell.—p. 47.
Review of Cardiac Cases in Changsha Treated in the Hsiang-Ya Hospital 1929 to 1932. Louise Farnam Wilson.—p. 53.

Archives des Maladies du Cœur, Paris

28: 73-120 (Feb.) 1935

*Erythrocyte Sedimentation in Myocardial Infarction. G. Bickel, J. Mozer and F. Sciclounoff.—p. 73.
Cardiovascular Insufficiency and Hepatic Insufficiency. O. Postranecky.—p. 86.

Erythrocyte Sedimentation in Myocardial Infarction.—Bickel and his collaborators studied the rate of blood sedimentation in patients following coronary thrombosis. The Westergren method was used. Parallel observations of fever and leukocytosis were made. The fever and leukocytosis occurred early after the infarction but returned rapidly to normal. A markedly increased rapidity of erythrocyte sedimentation did not develop for about two or three days after the infarction, reached its maximum in a day or two and returned to normal after several weeks. In this respect there was a difference with the febrile and leukocytic responses. The reason for an increased rate of blood sedimentation—which occurs usually only in infectious states and malignant tumors—is not clear. It is probably connected with disturbances in fibrinogen. The authors believe that the use of the erythrocyte sedimentation test in myocardial infarction will prove a useful adjunct to the clinical signs and the electrocardiogram in deciding how soon after myocardial thrombosis a patient may return to some activity.

Presse Médicale, Paris

43: 337-360 (March 2) 1935

Problem of "Healthy Spitters" of Tubercle Bacilli. F. Meersseman.—p. 337.
Duodenal Ulcer. E. L. Turner and A. G. Lattuf.—p. 339.
Dinitrophenol in Therapeutics. A.-R. Salmon.—p. 341.
*Hypochloremia and Vomiting. R.-S. Mach.—p. 342.

Hypochloremia and Vomiting.—Mach reports two cases in which a true dechloridation resulted from hypochloremia secondary to persistent vomiting. Careful observation allowed him to conclude that a plasma and erythrocyte hypochloremia may be observed in the course of repeated vomiting of patients with achlorhydria. This is accompanied by uremia and an increase in the alkali reserve. The hypochloremia of achlorhydric patients may be explained by the continuous loss of gastric fluid containing chlorides even in the absence of hydrochloric acid. The uremia of the hypochloremic patients is a uremia without renal damage, as was shown by the proved anatomic integrity of the kidneys at necropsy in his two cases.

Schweizerische medizinische Wochenschrift, Basel

65: 269-288 (March 23) 1935. Partial Index

Electrotherapy from Point of View of Modern Electrophysiology. O. A. M. Wyss.—p. 274.
Diagnosis of Traumatic Cerebral Injury. E. Grünthal.—p. 277.
*Coagulation of Blood and Blood Platelets. K. Lenggenhager.—p. 278.
*Cerebral Disturbances in Course of Acute Articular Rheumatism. G. Gottsegen.—p. 280.
Action of Some Metallic Ions on Tonicity of Myocardium. A. Moukhtar.—p. 281.

Coagulation of Blood and Blood Platelets.—Lenggenhager points out that the rapid coagulation of the blood outside the body is generally ascribed primarily to the blood platelets, which, stimulated by the foreign surface and by the air, produce a substance (thrombokinase or cytozym) which, together with calcium and the blood substances prothrombin or serozym produces thrombin. To determine whether or not the kinase is derived chiefly from the blood platelets, the author made experiments which demonstrated that, as formers of thrombokinase, the blood platelets have practically no significance and thus are not responsible for the coagulation of blood outside the body. The coagulation is induced by the transformation of a prokinase that circulates in the blood and which, under the influence of evaporation and of the adhesiveness of the surroundings and in the presence of calcium ions, produces the thrombokinase, which in turn, together with the prothrombin of the blood and in the presence of calcium ions, produces thrombin, the coagulation ferment. This explains also why normal coagulation time exists in thrombopenia.

Cerebral Disturbances in Acute Articular Rheumatism.—Gottsegen describes two cases of articular rheumatism in which a severe cerebrospinal symptomatology (restlessness, stupor, delirium, reflex disturbances, rigidity of the neck) developed during the second week. These symptoms disappeared again after a few days, and a short time later the articular symptoms disappeared likewise. The author considers this disorder a milder form of the meningo-encephalitis rheumatica recently described by American authors.

Archivio Italiano di Chirurgia, Bologna

39: 221-400 (Feb.) 1935

*Hepatic Function in Relation to Operation and Anesthesia, in Surgical Diseases, in Diseases and Drainage of Biliary Tract. S. Teneff.—p. 221.
*Research on Secretion of Bile in Drainage of Biliary Tract. E. Zilocchi.—p. 301.
Experimental Research on Pulmonary Prolapse. O. Betto.—p. 361.
Contribution to Study of Torsion of Great Omentum. E. Lucca.—p. 388.

Hepatic Function in Relation to Anesthesia.—Teneff studied the hepatic function of patients having diseases involving the liver and of those with diseases of the biliary tract before and after operation. He also studied the influence of the surgical drainage of bile on the hepatic insufficiency of patients having biliary calculi and hepatogenous icterus. He investigated the glycemia on a fasting stomach and the glycemic curve after oral administration of 40 Gm. of dextrose, the amino-acidemia on a fasting stomach, the amino-acidemic curve and the amino-aciduria after oral administration of 50 Gm. of gelatin, the bilirubinemia, the retention of bengal red and the daily elimination of urobilin. In all patients having diseases of the biliary tract, the functional tests indicate a degree of hepatic insufficiency that is aggravated by anesthesia and by operation. The postoperative aggravation depends not only on anesthesia but also on surgical intervention, because the two factors act at the same time and perhaps with the same intensity on the liver. Drainage of the biliary tract acts favorably on the functional condition of the liver only when the insufficiency is due principally to biliary stasis and to icterus. Liver function is improved in the case of stone in the common bile duct and in cases of hepatogenous icterus, while it has not had any benefit in the case of stone of long duration without stasis and icterus. Thus it is not possible to judge function conditions of the liver and to formulate a prognosis from results obtained by a single method. Several methods should be employed in all cases.

Secretion of Bile in Drainage of Biliary Tract.—Zilocchi studied the bile secretion of seven patients operated on for drainage of the biliary tract, three for partial and four for total drainage. He found that immediately after operation there is a secretion of dark bile which lasts from five to six days, gradually returning to a normal color. During the transition from dark to light bile the changes in the daily secretions become accentuated. These changes are slight in cases of total drainage but are marked in those of partial drainage. In total drainage the nocturnal bile is more concentrated than the daily bile, whereas in partial drainage the bile is secreted during the night while during the day there is a flow of clear fluid resembling cystic secretion. The quantity of bile secreted during the first day was constantly less than that of the following days, which is attributed to the action of the anesthetic on the liver. Research on the amount of mucus in the bile gave constant results. In bile removed during or after intervention by means of puncture of the gallbladder, the amount of mucus showed an increase of from 2 to 4 per cent. The degree of change in the biliary pigments corresponds to the change in the color of the bile. Immediately after operation the pigments are present in large quantities. By the second day there is a rapid diminution of the pigments, although a large amount is still present for from five to six days, which then gradually reaches a minimum value. The notable increase in pigments in the immediate postoperative period is due to (1) the reabsorption of extravasated blood and the hemolysis produced by the anesthetic; (2) the anesthetic itself, which diminishes the secretion of water, causing a relative increase of the concentration, and lowers the threshold of elimination for the pigments of the hepatic cells; (3) the elimination of pigments from the organism in cases in which icterus exists; (4) the relative dehydration in the immediate postoperative period, and

(5) the functional state of the liver. As to the elimination of cholesterol, two patients showed an increase in the bile, one a diminution and two the normal quantity. The author believes that food and fasting do not influence the elimination of cholesterol, because in postoperative fasting of several days' duration there was no decrease in elimination. Cholesterol is not derived solely from alimentation but may be formed in the organism independently of it. The hepatic cell is only the medium of elimination.

Prensa Médica Argentina, Buenos Aires

22: 409-456 (Feb. 27) 1935. Partial Index

*Respiratory Tests in Pulmonary Tuberculosis. A. A. Raimondi and R. Scartascini.—p. 409.
Tuberculosis and Fetid Abscesses of the Lung. C. Patiño Mayer.—p. 420.
Trypanosomiasis in Man: Case. O. A. Fitte.—p. 432.
Mechanism of Phrenicectomy. A. P. Heudtlass and O. Garré.—p. 433.

Respiratory Tests in Pulmonary Tuberculosis.—Raimondi and Scartascini say that the respiratory tests in pulmonary tuberculosis show marked changes, especially related to the vital capacity and to the respiratory indexes. Immediately after pneumothoracic insufflations the pulmonary ventilation diminishes. The respiratory indexes of patients with pulmonary tuberculosis improve as a result of the improvement of the pulmonary processes due to artificial pneumothorax. Both the evolution and the retrogression of pulmonary tuberculosis are in direct relation to the respiratory tests. The respiration of a 5 per cent mixture of carbon dioxide in oxygen causes a greater amplitude of respiration and increases the frequency of respiration and the time of voluntary apnea.

Archiv für klinische Chirurgie, Berlin

182: 1-158 (March 4) 1935. Partial Index

*Statistical Study on Anesthesia. F. Starlinger and H. Kiener.—p. 15.
Repair of Ventral Hernia by Means of Transplanted Fascial Strips. J. G. Knoflach and H. von Brücke.—p. 41.
*Incidence of Embolism and Thrombosis in Surgical Clinic of Innsbruck and First Surgical Clinic of Vienna. P. Huber.—p. 47.
Spontaneous Renal Fistulas. P. Deuticke.—p. 69.

Study of Anesthesias.—The object of this study, according to Starlinger and Kiener, was to establish the safety of various methods of anesthesia. The material surveyed consisted of major surgical operations performed from 1929 to 1934 in the First Surgical Clinic of Vienna. There were altogether 7,926 major operations and twenty-two fatalities, which took place in the course of the operation or immediately after. The number of operations performed under ether anesthesia was 3,646; under local anesthesia, 3,244; under nitrous oxide gas anesthesia, 863; under tribrom-ethanol, 131, and under evipan, 42. A careful analysis of the twenty-two fatalities revealed that in only one instance was the death caused primarily by the anesthetic, the method being that of spinal anesthesia. A statistical comparison of the postoperative morbidity and mortality as seen especially in the surgery of the upper part of the abdomen confirmed the fact that nitrogen monoxide gas anesthesia in combination with local anesthesia or with addition of small amounts of ether is the least harmful. The number of ether anesthetics given in the clinic showed a decline, while that of nitrogen monoxide combination anesthesia showed a rise. Tribrom-ethanol, evipan and spinal anesthesia are assigned an entirely insignificant part as anesthetics.

Embolism and Thrombosis.—According to Huber the incidence of postoperative thrombosis in the Vienna clinic was relatively twice as frequent as in that of the Innsbruck clinic. The difference is in part accounted for by the nature of the surgical material and in part by the greater tendency to thrombosis on the part of the Vienna population. The incidence of thrombosis in Vienna showed a considerable rise above the prewar and war periods. The author cannot confirm the statement of Hutter and Urban that thyrotoxic patients and jaundiced patients are not subject to this complication. Age is no protection against thrombosis. He reports an incidence of 0.36 per cent in the first decade. These thromboses, however, occurred only in severe septic conditions. The importance of infection in the etiology of thrombosis diminishes with increase in age. The most frequent localization of the thrombi was in the lower extremities. These, as a rule, were distant thrombi, occurring 202 times as compared with thirty-eight instances of thrombi localized in the operative field. Thrombosis of the pelvic veins gave rise to local and distant thrombi in about equal proportion. The author points to great frequency of thrombosis of the portal vein and of the jugular vein. The latter occurred as a complication of suppurative processes of the face and neck. In a total of 324 postoperative thromboses there were ninety-seven instances of thrombosis localized in the operative field and 227 instances of distant thrombosis. The occurrence of spontaneous venous thrombosis was rare and was either due to unusual overexertion or arose without surgical intervention in the course of some diseases that give rise to postoperative thrombosis, such as carcinoma of the breast, peritonitis or suppuration. The incidence of fatal pulmonary embolism in the Vienna clinic was even greater than the tendency to thrombosis when compared with that of Innsbruck. The indication for surgical intervention in the case of embolism of the pulmonary artery is made difficult by the uncertainty of the diagnosis of the condition. Of the seventy-five fatal postoperative pulmonary artery embolisms in the Vienna material, clinical diagnosis was made in fifty-two. Eight of the fatal embolisms occurred on the day of operation, five one day later and three on the second, another three on the third and six on the fourth postoperative day. The Trendelenburg operation was instituted in one case for an erroneous diagnosis of pulmonary artery embolism. In six correctly diagnosed cases the operation failed to bring about even a temporary improvement. The author reports ten cases of paradoxical embolism, a crossed embolism due to the existence between the two auricles of a patent foramen ovale. There were seventy-six instances of arterial thrombosis. Because of the poor results obtained with surgical intervention, the author recommends that arteriotomy should give way to conservative treatment with spasmolytic means.

Beiträge zur Klinik der Tuberkulose, Berlin

86: 37-116 (Feb. 21) 1935. Partial Index

*Meinicke's Seroreaction for Tuberculosis. F. Böhm and G. Grüner.—p. 37.
*Value of So-Called Phytotoxic Index in Pulmonary Tuberculosis. J. L. García and García-Miñon.—p. 45.
Concurrence of Pulmonary Tuberculosis and Pulmonary Carcinoma. W. Brokschmidt.—p. 49.
Pathogenesis of Circulatory Changes in Pulmonary Tuberculosis. J. Molnár.—p. 59.
Velez's Number and Its Relationship to Changes in White Blood Picture in Tuberculous Children. O. Felsenfeld.—p. 67.
*Pulmonary Hemorrhage in Tuberculosis and Hemorrhagic Diathesis. J. Leitner.—p. 100.

Meinicke's Seroreaction for Tuberculosis.—Böhm and Grüner assert that the Meinicke reaction for tuberculosis is a reaction of high sensitivity and specificity. They refer to an earlier publication for the description of the technic and discuss the observations on 500 patients, in some of whom the test was repeated several times. They reach the conclusion that Meinicke's reaction compares favorably with the Besredka reaction. They think that a clearly positive reaction, in which nonspecific interference can be excluded, makes a tuberculous etiology of the existing disorder highly probable.

Phytotoxic Index in Pulmonary Tuberculosis.—García and García-Miñon studied the phytotoxic index of 100 patients with pulmonary tuberculosis. They made in all about 220 tests, white lupine (Lupinus albus) serving as the test object. He summarizes his observations as follows: 1. The phytotoxic index has no diagnostic value in pulmonary tuberculosis. 2. Together with other clinical data (roentgenologic and laboratory examinations), the phytotoxic index has prognostic value in pulmonary tuberculosis. 3. In the benign cases, the phytotoxic index fluctuates between 42 and 76; that is, it is reduced (normal 76). In evolutive fibrocaseous cases, the phytotoxic index is increased to values fluctuating between 80 and 100. These values are surpassed during the preagonal period. 4. In patients with chronic, nonevolutive processes, the phytotoxic index fluctuates between 40 and 76; in the acute forms the index increases to values between 76 and 85. During periods of exacerbation with tuberculous cachexia, the phytotoxic index

increases to values from 86 to 92 and during the last stage it increases to from 93 to 129. This proves that the phytotoxic index is directly proportionate to the severity of the tuberculous disorder. 5. All patients in whom the phytotoxic index exceeds 100 either die or are in a grave condition. 6. During the advanced stage of tuberculosis the serum contains substances that greatly stimulate the growth of lupine roots. The nature of these substances is as yet unknown. 7. If concentrated tuberculin is added to the nutritive salt solution in which the lupines are kept, the growth is inhibited in proportion to the concentration of the tuberculin. 8. Repeated tests with the same blood revealed analogous results. 9. The term "phytotoxic index" is not entirely correct and should be replaced by one that expresses not only the toxic but also the stimulating effects. The authors suggest the term "phytopoietic index."

Tuberculosis and Hemorrhagic Diathesis. — Leitner asserts that tuberculosis is frequently the etiologic factor of forms of purpura, which occur in tuberculous patients. Purpura is most frequent in severe septic forms of tuberculosis or during the cachectic terminal stages. In these cases it is the manifestation of a terminal impairment of the hematopoietic organs and of the reticulo-endothelial system. In the milder forms of tuberculosis, purpura is not so frequent; it occurs, nevertheless, and generally becomes manifest during a new exacerbation and later subsides again. The author classifies this form with the anaphylactoid group of purpura and maintains that it is elicited by the tuberculous intoxication. Purpura is quite frequent during tuberculosis of the spleen. This observation is significant, because an early diagnosis makes a correct treatment possible. The purpura has been known to disappear following extirpation of the tuberculous spleen. The author investigated whether tuberculosis may produce a hemorrhagic diathesis that does not become manifest as a purpura but only as a predisposition to pulmonary hemorrhages. He thinks that the contradictory reports in the literature are partly due to the fact that only one symptom was investigated. It is known, however, that a predisposition to hemorrhage may develop when some factors change while others are unaltered. The author studied all pertinent factors: coagulation time, bleeding time, number of thrombocytes, retraction of the blood clot and the vascular factor. Studies on thirty-six patients disclosed that a latent tendency to hemorrhage in the form of an atypical hemorrhagic diathesis is the cause of pulmonary hemorrhages in only a small percentage of tuberculous patients. Moreover, it cannot be answered definitely in all cases whether this tendency to hemorrhages was caused by the tuberculosis or existed previously. Nevertheless, it seems that in a small number of cases pulmonary hemorrhages develop on the basis of a hemorrhagic diathesis, since tests on tuberculous patients without hemoptysis hardly ever reveal a tendency to hemorrhage.

Deutsche medizinische Wochenschrift, Leipzig

61: 325-364 (March 1) 1935. Partial Index

Pathogenesis, Course and Measures Against Epidemic of Typhoid Originating in a Dairy. H. Assmann and H. Dembowski.—p. 325.
Typhoid in East Prussia and Experiences During Last Typhoid Epidemic in Königsberg i. Pr. T. J. Bürgers.—p. 329.
*Quinine Intoxication and Quinine Idiosyncrasy. A. Hauer.—p. 332.
*Blood Pressure Reducing Hormones as Cause of Protein Shock. G. de Nito.—p. 339.

Quinine Intoxication and Quinine Idiosyncrasy.—Hauer shows that the prolonged use of quinine by inhabitants of the temperate zone living in the tropics produces an increasing sensitivity to quinine and eventually the acquired form of idiosyncrasy. He describes a case of acquired hypersensitivity to quinine. The great changes that became manifest in the blood picture as the result of the shocklike attacks elicited by quinine demonstrate the danger of the attacks. The nature of quinine idiosyncrasy is still problematic, but the attacks of fever elicited by the quinine give it the appearance of an acute intoxication. The author warns the practitioner against a too liberal use of quinine and stresses that the examination of an inhabitant of the temperate zone for his fitness for life in the tropics should not omit the test for idiosyncrasy to quinine.

Hormones as Cause of Protein Shock.—De Nito states that among the blood pressure reducing substances the hormone formed principally in the lymph nodes, and therefore designated "lymphoganglin," is the most important. Blood pressure reducing principles are found also in plants, and the latter substances closely resemble the animal hormone. Examination of the biologic action of the blood pressure reducing hormone disclosed a close resemblance to the modifications produced by protein shock; namely, reduction in blood pressure, leukopenia followed by leukocytosis, mononucleosis, change in the temperature, acidosis, reduction of the alkali reserve of the blood, changed coagulation time, reduction in the viscosity and in the refractometric index of the blood serum (hypoproteinemia) and hyperglycemia with secondary hypoglycemia. This similarity in the reactions raises the question of the presence of proteins in the hormone, but on the basis of a thorough chemical analysis of the hormone the presence of protein bodies could be excluded. He thinks that the protein substances first act on the lymphatic system and cause it to excrete a large amount of blood pressure reducing hormone into the circulation. The hormone in turn acts on the sympathetic nervous system, and thus the protein shock is produced. In discussing the therapeutic significance of the blood pressure reducing hormone, the author points out that it might be tried in cases in which the protein body therapy does not produce the desired results.

61: 405-444 (March 15) 1935. Partial Index

General Remarks on Inspection of Body Cavities by Optical Devices. O. Ringleb.—p. 405.
Problems in Diabetes Mellitus. C. Brentano.—p. 409.
*Calculation of Basal Metabolism from Pulse Frequency and Pulse Pressure. E. Wiechmann.—p. 414.
Fatal Intoxication Caused by Seeds of Castor Oil Plant. Abdülkadir-Lütfi.—p. 416.
*Cutaneous Lesions Caused by Reducing Remedies Containing Boric Acid. A. M. Memmesheimer.—p. 418.

Calculation of Basal Metabolism from Pulse Frequency and Pulse Pressure.—Wiechmann shows that, of the formulas suggested for the calculation of the basal metabolism, the modified formula of Read gives the most reliable results. In patients with cardiac and vascular disturbances, however, the formula cannot be used. The results obtained by Read's formula and those determined with the gas analytic method often show a surprising conformity. This applies also to the thyrotoxicoses. However, in borderline cases and in mild forms of thyrotoxicosis the formula is not entirely reliable. The analysis of the gas exchange is not made superfluous by Read's formula. The calculation according to Read only complements the use of the apparatus for gas analysis. Read's formula is especially valuable in estimating the effect of therapeutic measures. The author thinks that in the beginning it is advisable to use the apparatus for gas analysis and Read's formula side by side, but later the calculation according to Read's formula alone is sufficient. It is desirable that the determination of the pulse frequency and of the blood pressure be done by the same examiner.

Reducing Remedies Containing Boric Acid as Cause of Skin Disorders. — Memmesheimer states that a woman, aged 49, consulted him on account of an itching reddishness of the face, which later spread to the head, the neck and the trunk. The skin became thickened and showed fine scales and blisters. Questioning disclosed that she took a reducing powder. A cutaneous test with this powder gave a positive reaction. After the woman discontinued taking the powder, the skin disorder disappeared rapidly under the influence of the usual local therapy. Subsequently the author observed two other cases presenting a cutaneous disorder that resembled pityriasis rosea. Here again cutaneous tests, the appearance of the disturbance soon after the women had begun taking a reducing preparation and the rapid disappearance of the skin disorder after the use of the reducing preparation was discontinued indicated that the cutaneous lesions were due to boric acid. A fourth patient, a druggist, suggested of her own accord the possibility of a connection between her strongly itching exanthem and the taking of a reducing preparation. Here too the suspected connection could be demonstrated. The author concludes that in cutaneous disorders of stout persons the possibility of such an origin should be taken into consideration.

Deutsche Zeitschrift für Chirurgie, Berlin

244: 471-594 (Feb. 18) 1935. Partial Index

*Histologic Studies of Intramural Nerve Plexuses in Surgical Diseases of Stomach. W. Rieder.—p. 471.
*Immediate and Late Results of Lumbar Sympathectomy in Spontaneous Gangrene. A. Filatov.—p. 491.
Evaluation of Immediate and Late Results of Operative Treatment of Syringomyelia. A. Juželevskij.—p. 503.
Toxic Effect of Putrid Pus in Pleural Empyema. E. Schneider.—p. 521.

Intramural Nerve Plexuses in Diseases of Stomach.—Rieder reports a histologic study of the nervous apparatus of the stomach in ninety-four cases. Of these, seventy-one were cases of gastric or duodenal ulceration and nine were complicated by a perforation. There were six cases of gastritis, five cases of gastric cancer and three specimens resected because of a suspicion of ulcer but in which neither gastritis nor ulcer was found. To demonstrate the nervous structures the author used a modification of the Bielschowsky-Gros method. More or less severe alterations of the intramural nerve ganglions were found scattered over the whole resected specimen in every case. Here and there were found round-cell accumulations between the nerve fibers. The same alterations were found in the three cases in which gastric resection was performed because of the existence of symptoms of three years' standing but in which neither gastritis nor ulcer was found. Alongside the degenerative processes were found regenerative processes as well, particularly in the crater of the ulcer and its vicinity. The author does not feel justified in considering the pathologic alterations in the three specimens that did not exhibit either gastritis or ulcer as forerunners of these lesions.

Lumbar Sympathectomy in Spontaneous Gangrene.—Filatov reports the results of lumbar sympathectomy in thirty-four cases of spontaneous gangrene. The immediate effect was excellent in seventeen, satisfactory in eleven and negative in five. One patient died shortly after the operation from wound infection and general sepsis. Of fourteen cases that were followed for from one to six years, a permanent result was obtained in nine and a satisfactory result in two. In the remaining three cases morbid manifestations returned six months, two years and three years after the operation. The author collected 294 cases from the literature which, together with the author's new thirty-four cases and the fifty-one reported by his chief Hesse in 1929, total 379 lumbar sympathectomies performed for spontaneous gangrene. The immediate result was good in 80 per cent of these, and in many the results remained permanent. He concludes that lumbar sympathectomy is a well founded procedure in cases of spontaneous gangrene. However, a satisfactory result can be expected only with the application of a faultless technic insuring a fairly complete desympathization of the extremity. Success likewise depends on a rigorous selection of cases. Sympathectomy can be expected to bring about an improvement only in cases presenting vasomotor disturbances and in the absence of extensive thrombosis. The author considers the protein test the most reliable indication for the operation. In the evaluation of the test one should consider not only the rise of the skin temperature of the extremity but likewise the changes in the pulsation of the peripheral vessels and the subjective sensations of the patient.

Klinische Wochenschrift, Berlin

14: 361-400 (March 16) 1935. Partial Index

Influence of Adrenals and Hypophysis on Blood Pressure Regulation and on Alteration of Sex Characters in Human Subjects. J. Bauer.—p. 361.
*Significance of Hypophysis for Disease of Kidney. H. Marx.—p. 367.
Quantitative Estimation of Excretion of Gonadotropic Substance in Sexually Mature and in Senile Men. H. Saethre.—p. 376.
*Studies on Regional Differences in Intracutaneous Tests. W. Schmidt. —p. 378.
Therapy Resistant Syphilis, Particularly Parenchymatous Keratitis and Its Treatment with Quinine. J. Schereschewsky.—p. 381.

Significance of Hypophysis for Disease of Kidney.—Marx points out that clinical and experimental observations have given rise to the question whether the hypophysis plays a part also in the disorders of the kidney. The answer has become more difficult since recent studies on the hypophyseal system and its functions have uncovered more new problems than definite results. The interrelation between nervous and hormone processes, the connections between the anterior and posterior lobes and the question of the homogeneity of the different hormones are being disputed. Moreover, the conceptions about certain renal diseases have changed. Nevertheless there is one form of renal disorder in which an involvement of the hypophyseal system is generally conceded; namely, the renal disorders of the toxicoses of pregnancy, for the blood of patients with these disorders was found to contain substances that increased the blood pressure and inhibited the diuresis. Similar substances have been found also in patients with so-called pale hypertension. To determine whether these substances are a hormone of the posterior lobe of the hypophysis, the author tested their effect on the diuresis. He found that the substances extracted from the blood of patients with renal disease, with hypertension or with epilepsy not only increase the blood pressure but also inhibit the diuresis and effect a considerable increase in the sodium chloride concentration of the urine. This made it probable that these were the same substances that Anselmino and Hoffmann had detected in the blood of women with eclampsia. The author mentions other disorders in which changes in the hypophysis concur with renal disturbances: diabetes insipidus and tumors of the hypophysis. Moreover, a number of hypophyseal changes have been observed in patients with hypertension. After describing animal experiments, the author formulates his theory about the part played by the hypophyseodiencephalic system in renal diseases in the following manner: The toxins that circulate in the organism during infectious diseases and produce changes in the water and the sodium chloride content of the plasma of patients with renal disease cause an irritation of the hypophyseal system. This irritation becomes manifest in an increased production of the hormone of the posterior lobe of the hypophysis. This hormone is first secreted in the cerebrospinal fluid, from which it reaches the blood and, together with other factors (among them increased water intake), exerts its deleterious effect by producing hypertension of the vessels and hematuria and anuria in the kidneys. The author admits, however, that the changes in the central regulation represent only one factor among several that are responsible for the development of renal diseases. He does not deny that the direct action of the toxins of infection, of intestinal toxins and of waste products on the vascular system and the kidneys plays a part. In the treatment, the hypophyseodiencephalic as well as the other factors should be given consideration.

Regional Differences in Intracutaneous Tests.—Schmidt states that in former experiments he tested the skin of various regions of the body for its sensitivity toward intracutaneous allergen injections and was able to determine that the skin of the back reacts much more strongly than that of the upper extremities; that on the forearms the reactions were more pronounced than on the upper arms, and that the flexor surfaces were more sensitive than the extensor surfaces. On the basis of these observations he pointed out that, in comparing the size of wheals, it is not permissible to draw conclusions about the monovalence or the predominating specificity of the allergen that has produced the strongest reaction, unless all intracutaneous tests have been made on the same region of the body. The author concedes that this factor is given due consideration by most examiners, in that they make the wheals only on the back or on the upper arm. Since this practice has been found generally satisfactory, it would be unnecessary to search for regional differences in more limited areas, if such differences had not been actually observed. It was noted that wheals induced four fingerbreadths below the spine of the scapula were only half as large as those produced in the region of the spine of the scapula itself. If this should be generally true, it would be of great significance for intracutaneous tests. The author studied this problem. He demonstrated by means of intracutaneous injections that adjoining cutaneous regions on the extensor surface of the upper arm and on the back generally produce wheals of equal size. However, near the olecranon the wheals become somewhat larger, and at the transition from back to neck the wheals become smaller than on the other portions of the back. Consequently it is advisable to avoid the elbow region and the region above the spine of the scapula in intracutaneous skin tests. Aside from these exceptions, the upper arms and the back can be used for intracutaneous tests without hesitancy.

Medizinische Klinik, Berlin

31: 333-364 (March 15) 1935. Partial Index

Serodiagnosis by Means of Nonetiotropic Reactions. R. Otto.—p. 333.
*Short Wave Therapy of Articular Disturbances. E. Last.—p. 342.
What Does Treatment with Jejunal Tube Accomplish in Disorders of Stomach and Duodenum? R. Korbsch.—p. 345.
*Results Obtained with Lemon Juice in Carriers of Diphtheria Bacilli. Börngen.—p. 347.
Abortive Treatment of Peritonsillitis. E. Wodak.—p. 348.

Short Wave Therapy of Articular Disturbances.—Last states that, in treating articular inflammations with short wave therapy, he always chose a dosage that the patient felt as a pleasant sensation of heat. In chronic cases, however, a dosage was used that would heat the joints thoroughly. The author never observed burns or other impairments that could be ascribed to excessive dosage. He employed a tube apparatus that could be set for any wavelength between 4 and 15 meters and also a spark-gap apparatus that produced wavelengths of about 7 meters. He refrains from a definite evaluation of the two types of apparatus but emphasizes that only those types should be used which, while producing short wavelengths, permit the use of great energy in order to produce the necessary depth action within the joint. He concludes that short wave therapy is a valuable addition to the therapeutic armamentarium of articular disorders but admits that, like other treatments, it fails occasionally. The rapid disappearance of pains frequently permits the earlier application of a more active therapy. Repeated roentgenologic control examinations disclosed that existing anatomic changes in the joints were not influenced by short wave therapy. In florid tuberculous processes of the joints, short wave therapy is inadvisable.

Lemon Juice in Treatment of Diphtheria Carriers.—Börngen found that lemon juice is an effective remedy against the diphtheria bacilli of carriers. Children were given three times daily two drops in the nose and twenty drops by mouth. This treatment was continued for ten days, and at the end of that period the diphtheria bacilli had completely disappeared. The author's observations were made in fifteen cases. He admits that the introduction of the lemon juice in the nose is somewhat painful but emphasizes that the efficacy of lemon juice surpasses that of the various dye solutions.

Münchener medizinische Wochenschrift, Munich

82: 405-444 (March 14) 1935. Partial Index

*Practical Significance of Serodiagnosis of Gonorrhea. A. Poehlmann.—p. 405.
Significance of Serial Roentgen Examinations in Campaign Against Pulmonary Tuberculosis. L. Hantschmann.—p. 409.
*Experiments on Action of Vegetable Digestive Ferment in Human Beings. G. Bodechtel and W. Kinkelin.—p. 413.
Diuretic Action of Salts of Bile Acids. B. Stanojević and Olga Andrić.—p. 416.
*Acute Appendicitis in Case of Tapeworm. T. Altenkamp.—p. 418.

Serodiagnosis of Gonorrhea.—Poehlmann discusses the complement fixation reaction and points out that Meinicke has adapted his clarification reaction and Müller his conglobation reaction for the diagnosis of gonorrhea. He observed in comparative tests that the conglobation reaction of Müller is superior to Meinicke's clarification reaction and that the complement fixation reaction in turn is superior to Müller's conglobation. He says that the complement fixation reaction is valuable in the diagnosis and the differential diagnosis of gonorrhea, particularly since a soluble gonococcus toxin has been employed as antigen. The complement fixation test is helpful in the deep gonorrheal complications in men and women, in which bacteriologic examination frequently fails, and particularly in the doubtful articular disturbances. In the latter conditions it is frequently the only method that permits a definite diagnosis. A negative outcome of the complement fixation test permits the exclusion of gonorrhea in these cases. However, the complement fixation reaction is not absolutely reliable for the prognosis and for the determination of a definite cure of a gonorrheal process.

Action of Papaya Juice.—Bodechtel and Kinkelin call attention to the juice of the fruit of the pawpaw tree (Carica papaya), which, because of its digestive action on proteins, has been designated as vegetable pepsin. The authors think that "vegetable trypsin" would be a more suitable term, since it decomposes protein bodies further than does pepsin and since it contains also a fat soluble component (lipase) and a rennin-like principle. Thus the papaya juice contains all the important digestive enzymes. However, since a dry preparation of this juice has a much weaker action than the fresh juice, attempts were made to combine it with a harmless but effective activator. This aim was realized by combination with another vegetable extract. The authors mention experiments by which it was demonstrated that this combination is harmless, well tolerated and an aid to digestion. They recommend this preparation in achylia, anacidity, dyspepsia and disorders of the bile passages.

Acute Appendicitis in Case of Tapeworm.—Altenkamp states that he observed a number of cases of appendicitis in which oxyurids, trichocephali and ascarids were the cause, for they were found in the appendix and had produced the inflammation. Then he describes two cases in which segments of a tapeworm were found in the inflamed appendix. He emphasizes that, although in the reported cases the appendicitis could not be doubted, caution is necessary in deciding on laparotomy in cases of tapeworm, since appendicitis may only be simulated. He illustrates this with a case history. The operation is especially dangerous in the case of tapeworm, because the postanesthetic vomiting may bring the larval form (cysticercus) into the stomach, and, after having lost their cystic membrane, they may commence their invasion of the organism. To be sure, the simultaneous occurrence of tapeworm and cysticercus is rare (immunity?). The knowledge that a tapeworm is present should not be taken as an excuse for the postponement of a necessary operation. Even though it is known that a tapeworm is present, the decision regarding the necessity of an operation should be based on the same factors that determine the appendectomy in the absence of a tapeworm. The healing of the laparotomy wound should be followed by the expulsion of the tapeworm.

Wiener klinische Wochenschrift, Vienna

48: 289-320 (March 8) 1935. Partial Index

Postoperative Thrombosis and Embolism. E. Ranzi and P. Huber.—p. 289.
Etiology and Therapy of Lymphogranulomatosis. A. Herz.—p. 300.
*Observations on Fundus Oculi in Acute Polyarthritis. A. Pillat.—p. 302.
Calculation of Date of Birth According to Naegele. L. Kraul.—p. 305.

Changes in Fundus Oculi in Polyarthritis.—Pillat states that for a number of years he observed that patients who had an attack of severe acute articular rheumatism or chronic articular rheumatism quite often had choroiditic foci in the fundus oculi, which as a rule were far in the periphery so that they readily escaped observation. He examined the fundus oculi of twenty-eight patients and discovered seventeen who had choroiditis. In three other cases the choroid showed changes the nature of which could not be definitely identified, and they were not included in the number of choroiditis cases. Only eight patients were entirely free from changes in the fundus. He points out that, morphologically, the choroiditic changes observed in acute polyarthritis do not differ from tuberculous choroiditis. Moreover, the patients had a high sensitivity to tuberculin and the Löwenstein blood culture for tubercle bacilli was positive in eleven of the seventeen patients. The author recommends ophthalmoscopic examination for patients with acute polyarthritis.

Zeitschrift für Tuberkulose, Leipzig

72: 161-240 (Feb.) 1935

*Vital Capacity and Alveolar Carbon Dioxide Tension in Pulmonary Tuberculosis. A. Risi.—p. 161.
Epidemiologic Significance of Open Pulmonary Tuberculosis During School Age. F. Klein.—p. 176.
Culture of Tubercle Bacilli from Urine in Pulmonary Tuberculosis. Y. Tsuge.—p. 187.
Some Aspects of Pneumothorax Treatment Particularly During Change from Sanatorium to Ambulatory Treatment. H. Schoenemann.—p. 190.
Experimental Studies on Function of Reticulo-Endothelial System in Tuberculosis. Z. von Bernáth.—p. 193.

Respiratory Function in Pulmonary Tuberculosis.—Risi found that tuberculous patients with artificial pneumothorax usually have a reduced vital capacity. In patients in whom ordinarily the reduction was slight, the pneumothorax

treatment often reduced the vital capacity more. The alveolar carbon dioxide tension during eupnea showed only slight differences. The respiratory dynamics showed supernormal and subnormal fluctuations, according to whether the disorder impaired the pulmonary ventilation in a greater or lesser degree. The duration of the voluntary apnea proved to be considerably reduced in nearly all cases, and the degree of the reduction ran parallel with the degree and extension of the disease process. The alveolar tension of the maximal voluntary apnea revealed no relation to the duration of the apnea. The differential alveolar median tension was nearly always below normal. The alveolar carbon dioxide exponent did not indicate a correlative ratio between the duration of apnea and the differential alveolar tension. This exponent showed such a conformity with the physical and physiologic condition of the respiratory apparatus that on the basis of its value it was possible to determine the severity of the existing changes relative to the restricted respiratory surface.

Zentralblatt für Gynäkologie, Leipzig

59: 609-672 (March 16) 1935. Partial Index

Actinomycosis of Uterus. P. Hussy.—p. 611.
*Aspects of Granulosa Cell Tumors. E. Klaften.—p. 614.
Birth Injury of Ileosacral Joint in Infantilism. H. Schwalm and L. Bayer.—p. 624.
Technic of Kielland Forceps When Head Lies High and Pelvis is Flat and Generally Contracted. V. Föderl.—p. 629.

Granulosa Cell Tumors.—Klaften states that he has observed four more cases of granulosa cell tumors. The first case was that of a nullipara, aged 24. Formerly this patient had normal menstruation, but in the last four months she had become amenorrheal. After the extirpation of the granulosa cell tumor, menstruation set in again. The author gives case histories and points out in the conclusion that granulosa cell tumors may cause not only amenorrhea but also pathologic hemorrhages. In the cases here described the uterus was not removed, and it was therefore impossible to determine definitely whether hyperplastic changes were present in the uterus. However, certain symptoms indicate that such changes were present. After pointing out that the presence of granulosa cell tumor in children has been known to produce signs of early puberty, the author thinks that it cannot be doubted that granulosa cell tumors have a hormone action. He emphasizes, however, that a sex alternating effect of the hormone excreted by these tumors has not been proved as yet.

Sovetskaya Vrachebnaya Gazeta, Leningrad

Feb. 28 (No. 4) pp. 273-352 1935. Partial Index

Pathology of Digestive Organs. G. S. Belenkiy.—p. 279.
Objective Investigation in Ulcer Disease. I. O. Neymark.—p. 285.
*Dietetic Management of Pernicious Anemia. S. I. Sherman, M. P. Semenova, I. A. Alekseev-Berkman, A. V. Shcheglova and A. A. Shatalova.—p. 295.
*Effect of Fifty Days' Fast on Gastro-Intestinal Tract. G. G. Gazenko and L. D. Slavin.—p. 305.
Modes of Acute Cold Infections in Machine Factory Workers. L. S. Girshberg.—p. 309.

Dietetic Management of Pernicious Anemia.—Sherman and his co-workers find that liver feeding alone without addition of meat, vegetables and fruit is capable of accomplishing a striking curative effect. Liver diet was effective in all forms of pernicious anemia but was not effective in hyperchromic anemias of other than the Biermer-Ehrlich type. The authors consider large doses of liver not necessary. They obtained satisfactory results with 150 Gm. daily, and they consider 200 Gm. the maximal daily dose. A powdered liver extract was effective only in recent cases. It had no effect in patients with two or more recurrences. The twenty-four hour urobilin content of the urine declined markedly on liver feeding. After from three to six months of persistent liver therapy, the urobilin of urine approached the normal. The twenty-four hour determination of the urobilin content of the urine serves as an accurate index of hemolysis and, therefore, of the condition of the patient. The study of feces shows a marked improvement under liver therapy in the utilization and digestion of substances making up Schmidt's diet. Neutral fat after three months of liver therapy is digested 100 per cent, while its absorption amounts to 57 per cent as compared with 8 per cent before the liver diet was instituted. Digestion and absorption of muscle tissue increased after three months of liver therapy from 30 to 60 per cent. The authors have also noted an increase in blood sugar on liver diet and the presence of a normal hyperglycemic coefficient after a sugar test. With the application of uninterrupted liver diet an improvement was noted in the spinal cord symptoms.

Effect of Fifty Days' Fast.—Gazenko and Slavin report their observations on the behavior of the gastro-intestinal tract in the course of fifty days of complete fasting. The subject was a normal man, aged 38, who expressed his intention of fasting fifty days because of a theoretical notion on his part that the fasting would rejuvenate his entire organism. The following observations were made: After the prolonged fasting the stomach exhibited atony with marked stasis and lowering of the secretory function. The intestine continued to form fecal masses apparently from its secretions and products of desquamation, which did not differ from ordinary feces on a light diet except in quantity. A certain small amount of vegetable material from previously ingested food remained in the fecal masses as late as the fiftieth day. This was explained by the atonic state of the intestine and the change in the bacterial flora. The fasting did not influence ascaris eggs present during the entire period of fasting. Excretion of urobilin was carried on almost entirely by the kidneys and amounted to from three to four times that of the normal quantity.

Ugeskrift for Læger, Copenhagen

97: 321-348 (March 14) 1935

Masked Fractures in Neck of Femur. V. Aalkjær.—p. 321.
*Acute Lymphatic Leukemia with Collossal Infiltrates in Gastro-Intestinal Canal: Case. J. V. Jørgensen.—p. 327.

Lymphatic Leukemia with Infiltrates in Gastro-Intestinal Tract.—In Jørgensen's patient, a shoemaker aged 56, microscopic examination revealed hyperplasia of the preformed lymphatic tissue, proliferation of lymphopoietic tissue in nearly all the organs and the skin, especially prominent in the gastro-intestinal tract, leukemic changes in the blood, edema, siderosis, fibrinoid necrosis in the bone marrow of the femur, and small foci with myeloid metaplasia in some glands. All these conditions are seen as indications of a disorder of the hemolymphopoietic system. There were also inflammatory processes in the respiratory tract, and the author discusses the possibility of an inhalation toxicosis, pointing out that shoemakers may be exposed to various gaseous toxic substances, among them benzene.

Upsala Läkareförenings Forhandlingar, Uppsala

40: 183-420 (March 15) 1935

*Studies on Influence of Some Natural Fats and Their Components on Animal Tissue Structure: II. E. Agduhr.—p. 183, with Chemical Chapter by G. Blix and B. Vahlquist.—p. 190.
Influence of Magnifying Aids on Results in Test of Strength of Skin Capillaries. L. Billing.—p. 389.
Changes in Blood Pressure During Course of Experimental Scurvy in Guinea-Pigs. N. Söderström.—p. 393.
Tests Carried Out on Two Hundred Persons with Gothlin's Method for Determining Strength of Skin Capillaries and Statistical Treatment of Results. H. Greschwind and N. Rundqvist.—p. 403.

Influence of Natural Fats on Animal Structures.—In his investigations on the influence of different components of cod liver oil on organic structures, Agduhr found that the non-saponifiable fraction of cod liver oil is less injurious to mice than the saponifiable fraction, as shown by the death rate and in certain cases by the organic lesions. The heart lesions, however, were as a rule more marked in the animals given the nonsaponifiable fraction. Especially extensive experiments were performed with vitamin D and with ergosterol and viosterol. Long-continued administration of ergosterol exerted a definite toxic influence on the organism of mice. Ultraviolet irradiation of ergosterol increased its toxicity, especially on the liver, kidneys and adrenals. The lowered resistance of the mice against certain toxic substances, especially large quantities of ergosterol, on retardation of normal sexual functions is attributed to checking of the normal functions of the endocrine organs. The author says that pure vitamin D is considerably less toxic than viosterol when quantities with corresponding antirachitic effect are compared. Results point to gradual neutralization of the toxicity of the different constituents of cod liver oil.